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CARCINOMA OF THE CERVIX OF THE UTERUS.

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AND

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(Report from the Gynecological Clinic of The Johns Hopkins Hospital.)

Although the radical abdominal operation for patients suffering from carcinoma of the cervix of the uterus was advocated as early as 1895 by Rumpf,[1] Clark [2] and Ries,[3] and in 1900 by Wertheim,[4] its general adoption has been surprisingly slow, and there are, even at the present time, energetic antagonists. If such a procedure is to have a place in fighting such an otherwise hopeless malady, its efficiency can best be determined by the occasional "checking up" of the ultimate results in patients so treated.

In Cullen's [5] comprehensive monograph, the cases of cancer of the uterus operated upon in this clinic by the various methods, until April, 1899, were reviewed, and, so far as possible, the post-operative results were accurately determined. Since January, 1900, a more or less uniformly extensive abdominal operation has been employed in practically all operative cases, and the results herein given are based upon such cases extending over the period from January, 1900, until January, 1912. The operations were performed by Dr. Kelly, his associates and the resident gynecologists of The Johns Hopkins Hospital.

In many of the early cases of the disease, it is impossible to make an absolute diagnosis without a microscopical examination. In order not to submit any patient to such an extensive operation unnecessarily the positive diagnosis should be made in every case. This is best done by making frozen sections of the mucosa or portion of the cervix as suggested by Dr. Cullen [6] in 1895. As stated by him, "This rapid method is of great importance in those cases in which it is not desirable to administer an anæsthetic twice, as the patient can come to the operating room prepared for hysterectomy, which can be proceeded with as soon as the affirmative diagnosis is made. After curetting, the usual preparations will be made, and by the time they are completed the scrapings have been examined and the report is given. If carcinoma is present, the organ is removed at once; if, however, the examination is negative, the patient is returned to the ward, and is saved the suspense of awaiting for days to know whether she is suffering from malignant trouble or not."

Anæsthesia.—Complete relaxation is absolutely essential for a thorough dissection of the pelvic structures. In the majority of cases ether has been the anæsthetic employed, which is given by the open drop-method. In a few cases nitrous oxide, oxygen and a very small amount of ether have been given, which if competently administered approach most nearly the ideal anæsthetic in the majority of surgical operations. It is true, in the first place, that while the anæsthetic is being given, the patient is at her worst, and if necessary, the effects of the anæsthetic can be raised within a very few minutes; and in the second place the liability of post-operative pneumonia is greatly lessened. This form of anæsthetic is of especial value and is generally employed where there is any pulmonary complication or decreased renal function.

However, the choice of an anæsthetic must depend both upon the patient and the anæsthetist, since nitrous oxide poorly given is much inferior to ether moderately well administered.

Operation.—On account of the peculiar anatomical structure of the pelvic viscera, the extensive abdominal operation

must remain one of the most difficult surgical procedures, and the primary mortality will doubtless continue high even in the hands of the most skilled operators. As pointed out by Clark:[7] "If an operation or other therapeutic procedure is to have a permanent place in our armamentarium, it must be sufficiently easy to make it available, not for a few skilled specialists, but for the great body of surgeons working in every quarter of this and other countries. In these days of low primary mortality percentages attending nearly all the major operations, no operation can possibly gain extensive headway which carries with it a shockingly high mortality, and a large number of distressing and disabling sequelæ." It is not an operation that can be properly performed after two or three trials, but will always require the best surgical judgment and technique if it is to be followed by any degree of success. It is the immediate result that impresses the minds of the laity, and this effect is not to be counterbalanced by an occasional cure. Since the average surgeon sees but a few cases even in a decade, it can scarcely become universally popular, but will be practically limited to the larger clinics.

Although the original operation still remains the same in its fundamental principles—the wide excision of the uterus with the parametria and the surrounding lymph structures "en masse"—from time to time various modifications have been adopted in order to render the technique more perfect and to lessen the time necessary for its completion. Since metastases usually occur late in the progress of the disease, the radical operation is theoretically well founded; aside from the early recognition of the existing condition, possibly the greatest hope lies in the technical improvement of this operation whereby the high mortality will be lowered and the operation made suitable even to the average surgeon.

From 1900 to 1903, 13 cases were treated by atypical operations. Since the object of this review is to determine the ultimate value of the extensive abdominal operation, these cases are not included in the various summaries of percentages.

Operability.—Since carcinoma is for a considerable period a local disease, the progress at first being by direct extension in the majority of cases, the mobility of the cervix is the determining factor as to whether or not the radical operation is to be done. Judged by this standard in the series of cases reported by Cullen[5] from 1893 to 1899, the percentage of operability was 51.7. During the last seven years, 167 cases of carcinoma of the cervix of the uterus have been admitted to this clinic. Two cases refused operation. Out of 165 the radical abdominal operation was done in 95 cases, thus giving a percentage of operability of 57.2. In a way, such a high percentage of operability is misleading, as it does not represent the number in which there was any hope of absolute cure. Many of these cases were far advanced, and might have been sent away even by the most conscientious surgeon, but at their request the radical operation was done to relieve the symptoms.

Great efforts are being devoted to the developing of the operative technique, but unfortunately, its successful employment is tremendously handicapped by the failure in America to recognize the early symptoms. The usual history given by these patients is that they have suffered from irregular bleeding from seven to nine months, and have been submitted to various treatments.

In many cases the limitation of mobility of the cervix and induration are due to an inflammatory reaction surrounding the carcinomatous area, which renders the prognosis more hopeful. Case 16152 is a remarkable example of just such a condition. This patient was admitted to the ward, and the diagnosis of inoperable carcinoma of the cervix was made. A thorough cauterization was done simply as a palliative measure. Twelve days later when the patient was examined before being discharged from the ward, the cavernous cervical growth was found to have diminished greatly in size and to have become quite freely moveable. The radical abdominal operation was done, and her convalescence was uneventful. Her physician writes, March 24, 1913, three years and four months after operation: Mrs. J. is apparently in perfect health. She has grown very stout and does a great deal of hard work.

Radium.—While analyzing our cases of cancer of the uterus treated by the radical abdominal extirpation method, we have been more and more impressed with the distressing number of women who apply too late for relief. And not only is the large group distressing in which it is impossible to operate, but still more discouraging are those upon whom we operate and who then soon suffer from a recurrence. It is in this series of cases that radium used in large quantities (100 to 200 milligrams at a time) offers the definite hope of adding to the percentage of "permanently cured" cases.

Radium can be applied "in tube" in the following manner:

1. It is applied to the disease with a view to curing it without any operation. An instance of this kind has been reported by Chéron. The patient, dying later of another disease, was carefully examined, and the cancer found to have been completely eradicated.

2. Radium is used to irradiate the disease thoroughly before the operation with a view to rendering innocuous any small foci of disseminated cancerous cells which may not have been extirpated and which would inevitably bring about a speedy recurrence.

3. Radium is inserted at the end of an operation:

(a) To wipe out any cancerous cells left at the base of the broad ligament.

(b) In cases in which, relying upon the radium to destroy them, the operation has been conducted deliberately through diseased structures.

4. One of the most precious uses of radium is in early recurrences at the vaginal vault, or laterally out in the broad ligaments, to wipe out the disease.

The field of usefulness for radium is not limited by these radical measures, but it is also serviceable, even where it does not cure, in restraining the disease, in checking the secretions, and above all in relieving the often distressing pains.

Primary Mortality.—The high primary mortality has been the most discouraging feature in the employment of such an extensive operation. From the above table we find the total primary mortality to be 20.4 per cent, while for the last five

PRIMARY MORTALITY.

Gynec. No.	Serial No.	Time of death.	Cause.
8689	7	3d day.	Very advanced case; patient rapidly weakened; pulse became rapid, irregular and weak; never became rational; surgical shock.
9302	15	4th day.	Advanced case; time of operation 2 hrs. 55 min.; autopsy No. 1808; acute fibrinous pleurisy; acute diphtheritic and hæmorrhagic colitis.
9387	16	13 hours.	Very advanced case; incomplete operation; Hg. 35%; time of operation 1 hr. 23 min.; surgical shock.
9772	17	12 hours.	Early case; time of operation 2 hrs. 30 min.; patient was pulseless when returned to ward; surgical shock.
9860	19	18 hours.	Moderately early case; time of operation 2 hrs. 38 min.; autopsy No. 1985; showed no direct cause of death; surgical shock.
9920	21	4th day.	Advanced case; time of operation 2 hrs. 10 min.; pulse irregular and thready; cardiac failure.
10016	22	Immediately after wound was closed.	Very advanced case; time of operation 4 hrs. 15 min.; surgical shock.
10084	23	6th day.	Early case; time of operation 2 hrs. 45 min.; severe nausea and vomiting; autopsy No. 2034; cause of death not found; surgical shock.
10296	24	4th day.	Early case; time of operation 1 hr. 45 min.; peritonitis and intestinal obstruction.
10432	26	10th day.	Early case; time of operation 3 hrs.; kidneys showed acute nephritis.
10494	28	4th day.	Very advanced case; time of operation 2 hrs. 35 min.; autopsy; intestinal obstruction.
10505	29	14th day.	Very advanced case; time of operation 3 hrs. 30 min.; abscesses in kidneys (ascending infection).
11367	41	6th day.	Very advanced case; time of operation 3 hrs. 30 min.; autopsy No. 2336; œdema of lungs; fatty degeneration of the liver.
11404	42	17th day.	Advanced case; time of operation 3 hrs. 45 min.; uræmia.
11826	46	14th day.	Advanced case; time of operation 4 hrs.; severe nausea and diarrhœa; asthenia.
11985	47	21st day.	Moderately early case; time of operation 4 hrs. 30 min.; mitral and aortic insufficiency; cardiac collapse on 21st day.
12304	51	7th day.	Early case; time of operation 3 hrs. 40 min.; pneumonia beginning on 2d day.
12610	54	8th day.	Early case; time of operation 2 hrs. 30 min.; autopsy No. 2665; acute, general peritonitis; acute diphtheritic enteritis and colitis; acute splenic tumor; œdema of lungs.
12631	55	13th day.	Very advanced case; time of operation 2 hrs. 20 min.; general peritonitis and intestinal obstruction.
13380	66	11 hours.	Moderately early case; time of operation 3 hrs.; surgical shock.
13555	71	15th day.	Very advanced case; time of operation 2 hrs. 50 min.; autopsy No. 2856; septicæmia.
14236	79	25th day.	Very advanced case; time of operation 3 hrs. 15 min.; apparently cardiac failure.
15548	97	9th day.	Early case; time of operation 2 hrs. 35 min.; general diffuse peritonitis.
16206	109	6th day.	Very advanced case; time of operation 2 hrs. 55 min.; abdomen opened; no peritonitis; surgical shock.
16844	119	10th day.	Very advanced case; time of operation 2 hrs. 10 min.; lobar pneumonia.
17111	122	½ hour.	Very advanced case; time of operation 2 hrs. 15 min.; surgical shock.
17607	130	6th day.	Advanced case; time of operation 2 hrs.; general peritonitis.
18020	135	20th day.	Moderately early case; time of operation 3 hrs.; pulmonary embolism.

SUMMARY OF THE PRIMARY MORTALITY.

Surgical shock	9	cases
Peritonitis and intestinal obstruction	6	"
Nephritis	3	"
Cardiac complications	3	"
Pneumonia	2	"
Œdema of the lungs	1	case
Pleurisy	1	"
Pulmonary embolism	1	"
Septicæmia	1	"
Asthenia	1	"
Total	28	cases

PERCENTAGE OF PRIMARY MORTALITY.

Total number of cases.	Total primary deaths.	Total mortality percentage.
137	28	20.4
Cases during first 5 years.	**Primary deaths during first 5 years.**	**Mortality percentage.**
42	14	33⅓
Cases during last 5 years.	**Primary deaths during last 5 years.**	**Mortality percentage.**
69	8	11.5

years it has been 11.5 per cent, a reduction of nearly 50 per cent. Such a decrease in the immediate mortality is very encouraging when the percentage of operability has gradually increased. Obviously, an operator who selects only early cases will have a much lower primary mortality than the one who operates even when there is the slightest hope of saving these patients who are otherwise irretrievably lost. From a study of the primary mortality table, one will notice that the patients dying from the immediate effects of the operation were advanced cases with but few exceptions. The high total primary mortality was due chiefly to two facts, viz., in the earlier years the operation was new, and in many cases included the extensive glandular resection which prolonged the operation greatly, and the patient usually left the table in a tremendously shocked condition. From time to time various procedures have been adopted which have greatly decreased the primary mortality and morbidity.

With increased familiarity of the technique the time required for the completion of the operation has been greatly decreased. Similar operations, formerly requiring from three to five hours, are now completed within practically one-half the time.

Disinfection of the Growth.—It has been almost the universal custom to do a preliminary curettage and cauterization of the primary growth. Since nitrous oxide anæsthesia is so generally employed, this may be done several days before the abdominal operation with practically no detriment to the general condition of the patient. This procedure will usually cause a shrinkage of the cervix and increase the mobility, besides allowing time for a more efficient disinfection of the carcinomatous area by antiseptic douches and an improvement in the patient's general condition in this interval by tonics and forced feeding. A most thorough cauterization is done by means of ordinary "soldering irons," which are brought to a glowing heat and introduced deeply into the cervical canal, care being taken not to injure the bladder, rectum and uterine vessels. The cervical canal should also be dilated, since one will occasionally find a pyometra present, which is an absolute indication for the postponement of the operation. For several months the following technique has been employed immediately preceding the abdominal operation and has proved most satisfactory:

(a) The usual perineal and vaginal cleansing—soap and water, bichloride of mercury (1 to 1000) and alcohol, 70 per cent.

(b) Thorough cauterization of the primary growth.

(c) The application of benzine-iodine solution (1 to 1000 iodine) to thoroughly dehydrate the field.

(d) The application of tincture of iodine, 3.5 per cent.

(e) The vaginal canal is packed with iodoform gauze.

Apparently this gives very efficient disinfection, and none of these patients have subsequently developed peritonitis.

The Incision.—In all these cases a long, mid-line incision has been employed. In very fat patients, the resection of an ovoid area of skin with the subcutaneous fat in the mid-line (horizontal lipectomy) has been found to be of great advantage. By this method the depth of the field of operation is reduced

about 5 to 7 cm., and the ultimate result adds greatly to the general personal comfort of the patient.

The Catheterization of the Ureters.—Although the use of the ureteral catheters has not been followed uniformly, there has been no hesitancy in their employment. With the greater facility of catheterization incident to the improvement of cystoscopic technique, this procedure can be carried out within a few minutes before the general anæsthetic is given and will prove to be of the greatest assistance during the course of the operation. It is especially satisfactory in obese patients, where the exposure is difficult, since it lessens the time necessary for the isolation of the ureters and renders comparatively easy the control of hæmorrhage from the vaginal plexus of veins, which in many cases is the most troublesome part of the entire operation.

From a study of our cases we are led to conclude that the liability of uretero-vaginal fistulæ or secondary infection of the urinary system is not increased by this procedure. However, the following cautions should be observed:

(a) The minimal amount of manipulation with the least possible trauma is to be exercised.

(b) The ureteral sheath should not be disturbed at any point.

(c) The catheters should be removed when the ureters are completely isolated, and further manipulation should consist in rolling the ureters over, with the least possible disturbance to their blood supply.

The Lymphatic Glands.—As it is generally conceded that the lymphatic glands are implicated in from one-third to one-half of all operable cases, and since we have no means of determining that involvement except by microscopic examination, theoretically speaking, the ideal operation would include their resection in all cases. However, the present operative facilities and technique do not justify such an extensive operation on account of the great increase in the primary mortality and the probability of incomplete removal if extensive glandular involvement is present. Thus in Wertheim's large series of cases cured, there were only five survivors in whom there was glandular involvement at the time of operation. In our series of cases, for many years no attempt at removal of the lymphatic structures other than those of the parametria has been made.

The Resection of the Vagina.—After the thorough dissection of the parametrial and vaginal tissues to a point well below the extent of the growth, they are resected, the vaginal canal being first swabbed out to remove any infected accumulation. With a thorough preliminary cauterization, the widest possible resection with probably the least risk of immediate danger to the patient is obtained by the use of sharp dissection. However, in the more advanced cases the cautery may be employed to incise the vaginal walls and thus possibly destroy small areas of carcinomatous tissue that may remain behind. Here again, great care must be exercised not to injure the bladder, ureters and rectum. In order to get as far beyond the new growth as possible, the vagina, as a whole, is not clamped, but the incised edges are caught, and all hæmorrhage controlled by the application of Ochsner clamps.

As in all abdominal operations, denuded areas should be closed over as completely as is permissible. By this step of the operation, the liability to post-operative intestinal obstruction is reduced, and the injury to the ureters greatly lessened.

On account of the possible infection present in all cases, some form of pelvic drainage is to be advised. In this clinic, the most satisfactory drainage has been obtained by a small cigarette drain composed of gauze surrounded by rubber protective, placed through the vaginal opening. This drain is loosened on the third or fourth day and removed on the fifth or sixth day. Such a drain serves two important purposes, viz., intestinal obstruction may thus be prevented by taking care of any denuded areas, and also an outlet is provided for any accumulation in the cul de sac.

Occasionally the operative field is widely infected, either by a coincident extensive pelvic inflammation or a separation of the fundus from the cervix. In such cases a small cigarette drain is placed in the lower angle of the incision, which is removed on the second or third day after the operation.

The Post-operative Treatment.—Aside from the general measures for combating shock, there are many procedures which may contribute to a smooth convalescence. The excessive trauma to the bladder walls almost invariably causes temporary vesical paralysis, and formerly it was not unusual to catheterize a patient from thirty to forty times. For nearly one and one-half years liquids have been liberally given to all patients until they go to the operating room. This, together with the forcing of liquids practically as soon as the patient becomes conscious and the administration of salt solution by the rectum and by infusion, has reduced the number of catheterizations very markedly. Patients who have been submitted to a definite injury to the bladder are, however, catheterized more frequently to prevent overdistention, and occasionally a retention catheter is left in the bladder for a few days.

As far as possible, the immediate comfort of the patient is to be sought. Probably no one factor contributes more to this end than the employment of the Fowler position.

For several years in the care of these patients the Gatch bed has been employed, by means of which they can occupy the sitting posture. The following advantages are to be gained by such a position:

1. Pelvic drainage is facilitated with a tendency to limit the infection to the pelvic peritoneum.

2. Nausea and vomiting are decreased.

3. Respirations are performed more easily, since the pressure from the distended abdominal viscera upon the diaphragm is greatly lessened.

4. The liability of post-operative pneumonia is greatly decreased by frequent modifications of this posture.

POST-OPERATIVE SEQUELÆ.

Uretero-vaginal fistula (bilateral)	1
Uretero-vaginal fistula (unilateral)	5
Uretero- and vesico-vaginal fistula	1
Vesico-vaginal fistula	10
Recto-vaginal fistula	4
Cystitis	18
Prolapse of bowel	1
Incision opened spontaneously	2
Phlebitis	5

Post-operative Sequelæ.—Obviously, the more advanced the carcinomatous growth, the more difficult the operation and the greater are the possibilities of unfortunate post-operative sequelæ. In five cases both ureters were resected and implanted into the bladder; also, in five cases one ureter was treated in like manner; in three cases it was necessary to partially resect the bladder and one ureter; and in one case the bladder alone was partially resected.

As a rule the fistulæ occur late in the convalescence indicating a necrosis through interference of the blood supply. As Sampson has shown, the ureter has a blood supply of its own and can be lifted from its bed near the uterus without necrosis resulting, provided the ureteral sheath is not disturbed. The ureteral sheath is especially resistant to the progress of the carcinomatous growth, so that in advanced cases a certain amount of trauma seems justifiable. Hence a few ureteral fistulæ will occur, which may close spontaneously or will require uretero-vesical implantation later.

In two cases the entire abdominal incision opened about the eighth day. In one case this followed the removal of the stitches, while the other was brought on by a slight attack of coughing. Neither case apparently showed any tendency to heal, and the tissues presented a dull grayish appearance, possibly indicating the presence of a low grade infection. Both patients were taken to the operating room, and the incisions again closed. They both had an uneventful convalescence and are alive and well to-day, one three years and four months and the other, one year and ten months since operation.

In one case (No. 8539) a loop of small bowel prolapsed through the vagina when the pelvic drain was removed. This loop was replaced, a small pack was inserted into the vaginal vault, and the foot of the bed kept elevated until the vaginal opening closed.

By improving the technique and by exercising great care in the manipulations of the ureters, ureteral fistulæ have become very rare. From the table below, one will notice that there has been but one case (No. 120) during the last seven years which subsequently developed uretero-vaginal fistula. This patient was very obese, and exposure of the ureters was quite difficult. During the same period there have been four cases (Nos. 53, 128, 129, 134) which subsequently developed vesico-vaginal fistulæ and three cases (Nos. 110, 111, 131) of recto-vaginal fistulæ.

Late Results and Absolute Accomplishments.—Through the efforts of Winter, the statistical study of the end results of carcinoma of the cervix of the uterus has been placed upon a uniform basis, except for the so-called "disappeared" cases. Winter holds that these cases should be deducted, since statistics embracing great numbers of "disappeared" cases have no value whatever, while Wertheim [8] and many other operators contend that such cases should be counted as recurrences.

On undertaking the study of the end results in cases of this clinic, a definite plan for the desired information was adopted and carried out as far as possible. A letter was first sent to the physician referring the patient to the clinic. This plan met with the heartiest coöperation, and many of the patients were personally examined by the physician and an accurate result given. Since the majority of the patients were referred, the amount of clerical work was greatly diminished and more reliable results obtained. Letters were also sent to those patients who were not referred. In case the desired information was not obtained, letters were then sent to relatives and friends. Unfortunately, we have no means of tracing every patient and thus determining the exact result in all cases. Many of our patients come from the colored population whose migratory habits are well known, and after they have changed their residence twice it becomes quite impossible to locate them. However, after a considerable effort, all but ten patients who have been operated upon five years or more have been located and the results thus obtained are here given.

It is quite reasonable to suppose that at least one or more of these "disappeared" cases either had no recurrence or died from an intercurrent disease, which alone would make the percentage of cures untrue and at once depreciate the value of the operation. Hence, if after a diligent and exhaustive search there remain a few patients unlocated, and if these cases are deducted from the total number under consideration, we shall have at least a definite number of patients who have been treated by the extensive abdominal operation and the result of which will be definitely known. However, until this disputed point is settled, all statistical studies should embrace calculations based upon both premises as a basis of comparison of the results obtained in the different clinics.

During the first few years of the period with which this paper deals, the type of operation varied greatly. In all, 13 atypical abdominal operations and 17 vaginal hysterectomies were performed. In many cases an exploratory operation is necessary to determine whether or not a case is operable. From the "Frauenklinik" of Leipzig, out of 221 apparently inoperable cases, reported by Aulhorn,[9] 42 cases or about 20 per cent became apparently operable. Winter,[10] Wertheim,[11] Franz and Zinsser [12] insist that only those cases in which the uterus is not extirpated should be considered exploratory, but if the uterus has been removed, it should be classed as a radical operation. On the other hand, Wertheim [13] classes the patients in which he does a vaginal hysterectomy as inoperable. According to Winter [14] all cases of deaths from operation, without deductions, all cases in which the uterus was extirpated by vaginal, abdominal or combined vaginal and abdominal operations, although cancerous tissue is left behind, and all later deaths where autopsy does not clearly prove that death was due to other causes must be included in the five year period of observation. Statistics based upon cases treated by all operations can be of no value in determining the relative efficiency of any single operation, but merely show what is being accomplished in the treatment of carcinoma cases. To be sure, there must be a dividing line, and the personal factor must be eliminated as far as possible, yet it would seem that the palliative operation

should have a place in combating the terrible symptoms of so dread a malady. In this clinic, all cases are considered palliative in which there has been no attempt at the dissection of the ureters and the removal of the parametria, whether the operation was done to get rid of the mass of the cancerous growth for subsequent treatment with radium or to rid the patient of the almost unbearable symptoms.

In 16 cases (Nos. 7, 15, 21, 35, 50, 51, 52, 55, 69, 93, 100, 110, 119, 123, 124, 136) the operator was conscious of the fact that much cancerous tissue was left behind; yet, since the technique of the extensive operation was employed, these were considered radical and not palliative operations, although the prognosis was apparently hopeless.

Among the 137 cases of extensive abdominal operations, reported above, 82 cases have been operated upon five or more years ago. Of this number, 18 cases have remained well and free from recurrence; 22 cases died as an immediate result of the operation; one case (No. 14) died from intercurrent disease; and ten cases have disappeared.

If we leave out of account the primary mortality and the "disappeared" cases in considering the late results, we have the following:

Eighty-two cases minus 22 operative deaths, 1 death from intercurrent disease, and 10 disappeared = 49. Hence,

$$49 : 18 :: 100 : D$$
$$D = 36.7 \text{ per cent cured.}$$

If we include the primary mortality and leave out of account the "disappeared" cases, we have:

$$59 : 18 :: 100 : D'$$
$$D' = 30.5 \text{ per cent cured.}$$

If we include both the primary mortality and the "disappeared" cases we have:

$$81 : 18 :: 100 : D''$$
$$D'' = 22.2 \text{ per cent cured.}$$

From January, 1900, to January, 1908, 99 cases were considered inoperable, seven cases refused operation and the radical operation was done in 82 cases, making a total of 188 cases seeking relief.

From these 188 cases, besides the ten "disappeared" cases and the one case dying from intercurrent disease, seven cases refusing operation must also be deducted according to Werner's [15] method of calculation.

$$188 - 10 - 1 - 7 = 170.$$

Of these 170 cases, 18 remained free from recurrence at least five years, thus giving an "actual accomplishment" of 10.5 per cent.

According to Winter's formula the "actual accomplishments" are as follows:

$$A = \frac{O \times D}{100}.$$

"O" indicates the percentage of operated cases calculated from the number that presented themselves; "D" shows the "late results" (excluding the operative mortality and the "disappeared" cases). Hence,

"O" = 188 − 7 (refused operation) or 181.

$$181 : 82 :: 100 : O.$$
$$O = 45.2 \text{ per cent.}$$
$$A = \frac{45.2 \times 36.7}{100}.$$
$$A = 16.5 \text{ per cent "actual accomplishment."}$$

Conclusions.—From a study of the cases treated at The Johns Hopkins Hospital, the following conclusions are drawn:

1. The extensive abdominal removal of all uterine cervical carcinomata is justified where there is any hope of complete excision, unless there is some special contraindication to surgical interference. This operation, if properly performed, notwithstanding the high primary mortality, has given the greatest percentage of permanent cures of any therapeutic measure thus far suggested.

2. An exploratory operation is often necessary to determine whether or not a case is operable.

3. Obesity is not necessarily a contraindication to the operation, since the wide horizontal lipectomy decreases the depth of the field of operation.

4. The preliminary catheterization of the ureters is a valuable aid, especially in fat patients, and does not necessarily increase the probability of fistulæ and secondary infection of the urinary tract.

5. Decreased cervical mobility is sometimes due to a secondary inflammatory reaction and may be improved by a thorough cauterization of the primary growth.

6. Preliminary cauterization and disinfection of the primary growth are advisable in all cases.

7. Extensive glandular dissection is not justified, since the increase in permanent cures does not compensate for the rise in percentage of the primary mortality.

8. By improvements in the technique of the operation, the primary mortality has been decreased from 28.5 per cent for the first seven years to 11.5 per cent for the last five years. Further simplification and perfection of the details of this operation may yet reduce the primary mortality to nearly that of the ordinary laparotomy and make it more generally available.

Aside from the discovery of the etiological factor of carcinoma of the cervix of the uterus and its successful elimination, the greatest hope lies in the early recognition of the primary growth. This can only be accomplished by a more thorough training of the family physician as to the symptoms and signs of cancer and a systematic education of the laity.

TABLE OF CASES OF CARCINOMA OF THE CERVIX OPERATED UPON BY THE MORE RADICAL ABDOMINAL HYSTERECTOMY IN THE GYNECOLOGICAL CLINIC OF THE JOHNS HOPKINS HOSPITAL.

Gynec. No. Date. Serial No.	Age. Race. Preg. Symptoms.	Path. No. Examination.	Operation.	Immediate result.	Late result.
7510. Jan. 20, 1900. (1)	56 years. White. 1 child; menopause 10 years ago. Bloody vaginal discharge for 1 year; pain over lower spine for 3 months.	Path. No. 3759. Squamous cell carc. cervix.	Prelim. cath. ureters; prelim. curettage; wide abdom. operation, following radical plan of Wertheim and Werder; resection and transplan. of right ureter into bladder. Prognosis, bad.	Disch. Feb. 28, 1900.	Death Oct. 15, 1906; apparently a recurrence.
7627. March 14, 1900. (2)	31 years. Colored. No children. Bloody leucorrhœa for 6 months with slight abd. pain.	Path. No. 3904. Squamous cell carc. cervix.	Prelim. cath. of ureters; wide abdom. operation, following radical plan of Wertheim and Werder. Prognosis, fair.	Disch. April 15, 1900.	Feb., 1912: No recurrence; excellent health.
7819. May 17, 1900. (3)	40 years. White. 2 children. Bloody leucorrhœa for 7 months with bleeding following coitus. Hg. 35.	Path. No. 4074. Squamous cell carc. cervix.	Wide abdom. operation. Glands enlarged. Prognosis, fair.	Ureteral fistula on 14th day. Disch. June 12, 1900.	Died Sept., 1900; cause (?).
8108. Oct. 8, 1900. (4)	55 years. White. 11 children; menopause 5 years ago. Bloody discharge for 1 month.	Path. No. missing.	Prelim. cath. ureters; wide abdom. operation. Prognosis, good.	Disch. Nov. 9, 1900.	Feb., 1912: Excellent health; no recurrence.
8539. March 6, 1901. (5)	34 years. White. 3 children. Irregular attacks of bleeding for 4 months.	Path. No. 4745. Squamous cell carc. cervix. Pregnancy (4 mos.).	Prelim. cath. ureters; wide abdom. operation.	Bowel prolapsed when vag. drain was removed. Disch. March 26, 1901.	Death in 1 year; probably recurrence.
8577. April 4, 1901. (6)	38 years. White. 0 preg. Considerable bleeding daily for 1 month; cramp-like pains under costal angle for 3 months. Hg. 56.	Path. No. 4827. Squamous cell carc. cervix.	Prelim. curettage 3 weeks before; prelim. cath. left ureter; wide abdom. operation. Prognosis, good.	Vesico-vaginal fistula. Disch. April 28, 1901.	Not located.
8660. April 29, 1901. (7)	47 years. White. 4 preg. Irregular menstruation for 2 years with blood tinged leucorrhœa for 2 months.	Path. No. 4901. Squamous cell carc. cervix.	Prelim. curettage with excision of small bit of tissue for diagnosis; prelim. cath. of ureters; wide abdom. operation, incomplete removal. Prognosis, bad.	Death 3d day; surgical shock; Pt. never became rational after operation.	
8730. May 23, 1901. (8)	37 years. 8 preg. White. Constant bleeding 3 to 5 months.	Path. No. 4970. Squamous cell carc. cervix.	Prelim. excision for diag.; wide abdom. operation. Prognosis, good.	Disch. June 13, 1901.	Death 9 months after operation, probably a recurrence.
8733. May 16, 1901. (9)	35 years. 7 preg. Bleeding and irritable leucorrhœa for 3 months.	Path. No. 4930. Adeno-carc. cervix.	Wide abdom. operation; glands resected, involved. Prognosis, bad.	Disch. June 8, 1901.	Recurrence March, 1902.
8778. May 27, 1901. (10)	45 years. 4 preg. Intermenstrual bleeding for 2 years lasting 10 to 15 days; very offensive, watery discharge for 3 months.	Path. No. 4977. Squamous cell carc. cervix.	Prelim curettage 5 days before; prelim. cath. ureters; wide abdom. operation. Prognosis, good.	Disch. June 24, 1901.	Feb., 1912: Excellent health; no recurrence.
8983. Aug. 24, 1901. (11)	58 years. White. 9 preg; menopause 12 years ago. Leucorrhœa, blood tinged 3 months.	Path. No. 5167. Squamous cell carc. cervix.	Excision of portion of cervix for diagnosis; wide abdom. operation. Prognosis, good.	Disch. Sept. 20, 1901.	Death 2 years 11 months from recurrence.
9074. Oct. 10, 1901. (12)	34 years. White. 10 preg. Dull aching pain in pelvis for 6 months.	Path. No. 5232. Squamous cell carc. cervix, 4 months preg.	Prelim. cath. ureters; cauterization of cervix with dilatation and delivery of fœtus 2 weeks before; very adv. case; bladder involved. Prognosis, bad.	Vesico-vag. fistula. Disch. Nov. 8, 1901.	Death March 24, 1903, recurrence.
9228. Nov. 27, 1901. (13)	60 years. Colored. 7 preg.; menopause 10 years ago. Sharp, shooting pains over lower abd. and thighs for 6 months; severe leucorrhœa 6 months ago and slight constant bleeding since. Hg. 65.	Path. No. 5436. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, bad.	Disch. Dec. 17, 1901.	Feb., 1912: Excellent health; no recurrence.
9256. Dec. 7, 1901. (14)	64 years. White. 5 preg.; menopause 10 years ago. Irregular bleeding for 2 years. Pt. thought menses were returning. Hg. 82.	Path. No. 5457. Squamous cell carc. cervix.	Prelim. vaginal loosening; wide abdom. operation; glands not enlarged. Prognosis, fair.	Uretero-vag. fistula. Disch. Jan. 30, 1902.	Death 1903, from pneumonia.
9302. Feb. 6, 1902. (15)	31 years. White. 6 preg. Thick bloody leucorrhœa for 1½ years.	Path. No. 5573. Squamous cell carc. cervix.	Wide abdom. operation; incomplete. Prognosis, bad.	Death 4th day; autopsy 1868; acute fibrinous pleurisy; acute diphtheritic and hæmorrhagic colitis.	
9387. Feb. 26, 1902. (16)	46 years. White. 10 preg. Bloody leucorrhœa for 8 months with occasional severe hæmorrhage. Hg. 35.	Path. No. 5627. Squamous cell carc. cervix.	Preliminary curettage 20 days before; Prelim. cath. rt. ureter; wide abdom. operation; incomplete. Prognosis, bad.	Death 12 hours later from surgical shock.	
9772. July 16, 1902. (17)	58 years. White. 10 preg.; menopause 9 years ago. Irregular bleeding for 18 months.	Path. No. 5908. Squamous cell carc. cervix.	Prelim. curettage 1 week before; wide abdom. operation.	Death 12 hours later from surgical shock.	
9802. July 26, 1902. (18)	40 years. Colored. 4 preg. Irregular bleeding for 2 years. Hg. 55.	Path. No. 6019. Squamous cell carc. cervix.	Wide abdominal operation; resection of rt. ureter and implantation into bladder. Prognosis, fair.	Vesico-vag. fistula closed by operation. Disch. Oct. 26, 1902.	Recurrence after 2 years.
9860. Aug. 30, 1902. (19)	54 years. Colored. 6 preg.; menopause 8 years ago. Constant bleeding for 6 months.	Path. No. 6074. Squamous cell carc. cervix.	Prelim. curettage for diag.; prelim. cath. of ureters; wide abdom. operation; resection and implantation of left ureter. Prognosis, bad.	Death following night from surgical shock.	
9962. Sept. 17, 1902. (20)	44 years. White. 7 preg. Occasional severe bleeding for 6 months with constant watery discharge. Hg. 45.	Path. No. 6102. Squamous cell carc. cervix.	Prelim. cath. ureters; wide abdom. operation; ureters resected and implanted into bladder. Prognosis, fair.	Vesico-vag. fistula. Disch. Nov. 2, 1902.	Death 6 months later from recurrence.
9980. Sept. 25, 1902. (21)	57 years. Colored. 14 preg.; menopause 15 years ago. Irregular bleeding for 2 months. Hg. 75.	Path. No. 6117. Squamous cell carc. cervix.	Prelim. cath. ureters; wide abdom. operation; incomplete.	Death 4th day, cardiac complications.	
10016. Oct. 25, 1902. (22)	40 years. White. 0 preg. Increased menstrual flow for several months; offensive, irritating discharge for 3 months.	Path. No. 6197. Squamous cell carc. cervix.	Prelim. curettage, wide abdom. operation; resection of both ureters and implantation into bladder.	Death from surgical shock shortly after incision was closed.	

TABLE OF CASES OF CARCINOMA OF THE CERVIX OPERATED UPON BY THE MORE RADICAL ABDOMINAL HYSTERECTOMY IN THE GYNECOLOGICAL CLINIC OF THE JOHNS HOPKINS HOSPITAL—Continued.

Gynec. No. Date. Serial No.	Age. Race. Preg. Symptoms.	Path. No. Examination.	Operation.	Immediate result.	Late result.
10084. Nov. 20, 1902. (23)	44 years. White. Leucorrhœa for 3 months.	Path. No. 6284. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, fair.	Death 6th day; autopsy, 2034; cause of death not found.	
10206. March 14, 1903. (24)	44 years. White. 6 preg. Intermenstrual bleeding for 3 months; pain over lower abd. Hg. 60.	Path. No. 6538. Squamous cell carc. cervix.	Prelim. curettage 2 weeks before; prelim. cath. rt. ureter; wide abdom. operation. Prognosis, fair.	Death 4th day from intestinal obstruction and peritonitis.	
10324. March 18, 1903. (25)	54 years. White. 8 preg. Profuse irritating leucorrhœa for 2 years. Hg. 70.	Path. No. 6443. Squamous cell carc. cervix.	Prelim. cath. ureters; wide abdom. operation. Prognosis, fair.	Vesico-vaginal fistula. Disch. June 6, 1903.	March, 1911: Enjoying the best of health.
10432. April 29, 1903. (26)	62 years. White. 2 preg.; menopause 9 years ago. Dull pain over abdomen for 2 years; first bleeding 7 weeks ago while at stool. Hg. 68.	Path. No. 6669. Squamous cell carc. cervix.	Prelim. cath. ureters; wide abdom. operation. Prognosis, good.	Death 10th day, uræmia, acute nephritis.	
10444. May 6, 1903. (27)	56 years. White. 6 preg.; menopause, 12 years ago. Irreg. bleeding for 7 months. Hg. 74.	Path. No. 6680. Squamous cell carc. cervix.	Prelim. cath. ureters; wide abdom. operation.	Cystitis. Disch. June 22, 1903.	April, 1913: Entirely well since operation.
10494. May 16, 1903. (28)	36 years. White. 7 preg. Intermenstrual bleeding for 4 months.	Path. No. 6715. Squamous cell carc. cervix.	Wide abdom. operation resection of bladder and rt. ureter, very advanced case.	Death 4th day; autopsy; intestinal obstruction.	
10505. May 27, 1903. (29)	43 years. White. 6 preg. Menorrhagia for 2 months. Hg. 70.	Path. No. 6747. Squamous cell carc. cervix.	Wide abdom. operation; resection and implantation of both ureters; very advanced case.	Death 14th day, acute pyelo-nephritis.	
10523. June 3, 1903. (30)	41 years. White. 1 preg. Mal-odorous, profuse leucorrhœa for 2 years; considerable bleeding for 3 weeks.	Path. No. 6745. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, fair.	Cystitis with probable uretero-vag. fistula. Disch. July 3, 1903.	Not located.
10603. July 18, 1903. (31)	58 years. White. 13 preg.; menopause 1½ years ago. Slight blood-tinged leucorrhœa since.	Path. No. 6837. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, good.	Cystitis. Disch. Aug. 27, 1903.	March, 1912: Enjoying excellent health.
10622. July 25, 1903. (32)	48 years. White. 5 preg. Occasional attacks of bleeding for 18 months; pain over abd. and thighs for 4 months; frequent urination for 1 month. Hg. 80.	Path. No. 6860. Squamous cell carc. cervix.	Prelim. cath. ureters; wide abdom. operation. Prognosis, fair.	Uretero-vag. fistula (left). Disch. Aug. 27, 1903.	Death April, 1905, from recurrence.
10627. Oct. 3, 1903. (33)	39 years. White. 4 preg. Dragging sensation in pelvis for 5 months; no bleeding.	Path. No. 6885. Squamous cell carc. cervix.	Prelim. cath. ureters; wide abdom. operation; bladder injured. Prognosis, bad.	Vesico-vag. fistula. Disch. Oct. 20, 1903.	Feb., 1911: Entirely well.
10848. Nov. 12, 1903. (34)	35 years. White. 1 preg. Pain over lower abdom.	Path. No. 7077. Squamous cell carc. cervix.	Prelim. cath. ureters; wide abdom. operation. Prognosis, fair.	Disch. Dec. 16, 1903.	Recurrence April, 1904.
11134. March 31, 1904. (35)	35 years. Colored. 2 preg. Bleeding after douching and coitus for 6 months. Hg. 75.	Path. No. 7370. Squamous cell carc. cervix.	Prelim. cath. left ureter; wide abdom. operation; incomplete removal.	Cystitis. Disch. May 24, 1904.	Not located.
11192. April 16, 1904. (36)	37 years. White. 6 preg. Blood-tinged leucorrhœa for 10 months; pain over lower abd. 8 months. Hg. 73.	Path. No. 7419. Squamous cell carc. cervix.	Wide abdom. operation; rectum, involved; advanced case.	Recto-vag. fistula, 8th day. Disch. Nov. 24, 1904.	Death 3 months later from recurrence.
11225. May 2, 1904. (37)	50 years. White. 3 preg. Bleeding after stool for 3 months. Hg. 74.	Path. No. 7467. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, good.	Disch. May 30, 1904.	Oct., 1911: In excellent health.
11234. May 5, 1904. (38)	37 years. White. 7 preg. Metrorrhagia for 2 years; constant bleeding for 3 months. Hg. 55.	Path. No. 7468. Squamous cell carc. cervix.	Prelim. cath. ureters; wide abdom. operation; ureters resected and implanted; bladder involved.	Cystitis; uretero and vesico-vag. fistulæ. Disch. Aug. 24, 1904.	Not located.
11323. June 3, 1904. (39)	37 years. White. 4 preg. Irregular menses, 8 months; bleeding while at stool.	Path. No. 7601. Squamous cell carc. cervix.	Prelim. cath. ureters; wide abdom. operation. Prognosis, good.	Cystitis. Disch. June 24, 1904.	Feb., 1912: In excellent health.
11360. June 22, 1904. (40)	40 years. White. 3 preg. "Soreness" in womb for 1 year; bloody disch. for 7 months. Hg. 70.	Path. No. 7602. Squamous cell carc. cervix.	Wide abdom. operation.	Cystitis; uretero-vag. fistula, 18th day. Spontaneous closure. Disch. July 27, 1904.	April, 1912: In excellent health.
11367. June 27, 1904. (41)	63 years. Colored. 7 preg.; menopause 17 years ago. Vag. bleeding 5 years ago; occasional attacks since. Hg. 85.	Path. No. 7658. Squamous cell carc. cervix.	Wide abdom. operation; resection of both ureters.	Death 6th day; autopsy, 2336; œdema of lungs.	
11404. July 20, 1904. (42)	38 years. White. 7 preg. Hysterectomy, 4 years ago; occasional bleeding for 8 months.	Path. No. 7659. Squamous cell carc. cervix.	Wide abdom. operation; resection of bladder.	Death 17th day, uræmia.	
11771. Jan. 4, 1905. (43)	60 years. White. 9 preg.; menopause 10 years ago. Foul leucorrhœa for 3 years.	Path. No. 8153. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, good.	Disch. Feb. 2, 1905.	Not located.
11784. Jan. 7, 1905. (44)	29 years. Colored. 1 preg. Watery disch. for 2½ months; bleeding on examination. Hg. 55.	Path. No. 8161. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, good.	Phlebitis, 11th day. Disch. Feb. 19, 1905.	Not located.
11816. Jan. 19, 1905. (45)	30 years. Colored. 1 preg. Intermenstrual bleeding 4 months with watery disch.	Path. No. 8155. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, good.	Cystitis. Disch. April 1, 1905.	Not located.
11826. Jan. 25, 1905. (46)	62 years. White. 4 preg.; menopause 17 years ago. Bloody leucorrhœa 7 months.	Path. No. 8154. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, bad.	Death 14th day; asthenia.	
11985. March 28, 1905. (47)	44 years. White. 8 preg. Slight intermenstrual bleeding for 5 years; constant for 9 months.	Path. No. 8416. Squamous cell carc. cervix.	Prelim. curettage; wide abdom. operation.	Death 21st day, cardiac failure (mitral and aortic insufficiency).	

TABLE OF CASES OF CARCINOMA OF THE CERVIX OPERATED UPON BY THE MORE RADICAL ABDOMINAL HYSTERECTOMY IN THE GYNECOLOGICAL CLINIC OF THE JOHNS HOPKINS HOSPITAL—Continued.

Gynec. No. Date. Serial No.	Age. Race. Preg. Symptoms.	Path. No. Examination.	Operation.	Immediate result.	Late result.
12069. April 20, 1905. (48)	56 years. White. 4 preg.; menopause 2 years ago. Brown-colored leucorrhœa for 3 months.	Path. No. 8602. Squamous cell carc. cervix; adeno-myoma of the uterus.	Wide abdom. operation. Prognosis, good.	Disch. May 21, 1905.	Not located.
12184. June 17, 1905. (49)	28 years. White. 1 preg. Blood-tinged leucorrhœa with pain for 5 months.	Path. No. 8771. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, good.	Thrombosis of left femoral vein 12th day. Disch. July 31, 1905.	Death Dec. 3, 1905; cause, doubtful.
12244. July 19, 1905. (50)	50 years. Colored. 2 preg.; menopause 16 years ago. Bloody vag. disch. for 8 months; polyuria.	Path. No. 8840. Adeno-car. cervix and body of uterus.	Wide abdom. operation; incomplete; very advanced case.	Disch. Aug. 11, 1905.	Death March 2, 1908, from recurrence.
12294. Aug. 18, 1905. (51)	50 years. White. 7 preg.; menopause 1 year ago. Slight bleeding for last 7 months with watery disch.	Path. No. 8880. Squamous cell carc. cervix.	Wide abdom. operation; incomplete; very advanced case.	Death 7th day from pneumonia.	
12441. Oct. 21, 1905. (52)	49 years. Colored. 11 preg. irregular bleeding for 8 months.	Path. No. 9107. Squamous cell carc. cervix.	Wide abdom. operation; incomplete; very advanced case.	Disch. Nov. 9, 1905.	Death March 25, 1907, from recurrence.
12297. Jan. 10, 1906. (53)	37 years. White. 3 preg. Watery disch. for 6 months with much bleeding for 3 months.	Path. No. 9362. Squamous cell carc. cervix with metastases to vagina.	Prelim. curettage; wide abdom. operation. Prognosis, fair.	Vesico-vag. fistula 12th day; closed by operation. Disch. March 6, 1906.	Feb., 1912: In excellent health; no recurrence.
12610. Jan. 22, 1906. (54)	52 years. Colored. 3 preg. Sudden hæmorrhages for 3 months.	Path. No. 9372. Squamous cell carc. cervix; myoma uteri.	Prelim. curettage 1 week before; prelim. cath. ureters; wide abdom. operation.	Death 18th day; autopsy; general peritonitis; œdema of lungs.	
12631. Jan. 4, 1906. (55)	56 years. Colored. 6 preg.; menopause 6 years ago. Severe bleeding every month for 5 months. Hg. 65.	Path. No. 9395. Squamous cell carc. cervix.	Prelim. curettage; wide abdom. operation; incomplete; very advanced case.	Death 13th day; autopsy; general peritonitis.	
12640. Jan. 29, 1906. (56)	40 years. White. 2 preg. Slight intermenstrual bleeding for 6 months.	Path. No. 9389. Squamous cell carc. cervix; myoma uteri.	Prelim. curettage 1 week before; wide abdom. operation. Prognosis, good.	Cystitis. Disch. March 6, 1906.	Death Jan. 21, 1907, from recurrence.
12914. May 15, 1906. (57)	37 years. White. 6 preg.; youngest child 1 month old. Irritating leucorrhœa for 4 months.	Path. No. 9812. Squamous cell carc. cervix.	Curettage 6 days before; wide abdom. operation. Prognosis, good.	Disch. June 8, 1906.	March, 1912: No recurrence.
12918. May 14, 1906. (58)	42 years. Colored. 4 preg. Irregular bleeding for 6 months; profuse for 1 month. Hg. 50.	Path. No. 9841. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, fair.	Disch. June 2, 1906.	Not located.
12969. May 28, 1906. (59)	22 years. White. 1 preg. Blood-tinged leucorrhœa for 6 months.	Path. No. 9876. Adeno-carc. cervix; metastases to lymph glands; implantations on vaginal wall.	Wide abdom. operation. Prognosis, bad.	Disch. June 28, 1906.	Not located.
12987. June 7, 1906. (60)	30 years. White. 0 preg. Slight bleeding for 6 months.	Path. No. 10242. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, good.	Disch. June 27, 1906.	Feb., 1912: Excellent health.
13050. July 5, 1906. (61)	56 years. White. 3 preg.; menopause 10 years ago. Bleeding for 4 months.	Path. No. 10235. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, good.	Disch. Aug. 3, 1906.	Death Sept. 4, 1907, from recurrence.
13056. July 5, 1906. (62)	42 years. White. 0 preg. Irregular bleeding for 3 months; constant watery disch. for 2 months.	Path. No. 10077. Squamous cell carc. cervix; myomata uteri; pelvic inflam. disease.	Wide abdom. operation. Prognosis, good.	Disch. Aug. 20, 1906.	Death.
13249. Sept. 19, 1906. (63)	54 years. White. 2 preg.; menopause 8 years ago. Scanty blood-tinged disch. for several weeks.	Path. No. 10330. Squamous cell carc. cervix.	Prelim. excision for diagnosis; wide abdom. operation.	Cystitis. Disch. Oct. 11, 1906.	Death June 19, 1908, hæmorrhages from bowel (recurrence).
13289. Oct. 30, 1906. (64)	35 years. White. 2 preg. Irregular bleeding for 5 months.	Path. No. 10456. Squamous cell carc. cervix.	Prelim. curettage; wide abdom. operation. Prognosis, bad.	Cystitis. Disch. Nov. 12, 1906.	Death about 2 years later from recurrence.
13317. Oct. 24, 1906. (65)	23 years. White. 0 preg. Blood-tinged leucorrhœa for 1 year.	Path. No. 10446. Squamous cell carc. cervix; metastases to glands.	Prelim. curettage 1 month before; wide abdom. operation. Prognosis, bad.	Cystitis. Disch. Dec. 22, 1906.	Death 6 months later from recurrence.
13380. Nov. 17, 1906. (66)	47 years. White. 0 preg. Irritating disch. for 6 to 8 weeks.	Path. No. 10582. Squamous cell carc. cervix.	Prelim. cauterization; wide abdom. operation; advanced case.	Died 11 hours later from surgical shock.	
13435. Dec. 17, 1906. (67)	52 years. White. 7 preg.; menopause 3 years ago. Brownish vag. disch. for 3 months; "bearing down" pains over lower abdom. for 6 weeks.	Path. No. 10702. Squamous cell carc. cervix; myoma uteri.	Prelim. curettage; wide abdom. operation. Prognosis, fair.	Disch. March 2, 1907.	Death 1910, from recurrence.
13461. Dec. 26, 1906. (68).	59 years. White. 8 preg.; menopause 3½ years ago. Occasional blood stain on clothing for 4 months.	Path. No. 10668. Squamous cell carc. cervix.	Excision for diagnosis; wide abdom. operation. Prognosis, good.	Cystitis. Disch. Jan. 24, 1907.	Death Dec., 1907, from recurrence.
13525. Jan. 23, 1907. (69)	54 years. White. 6 preg.; menopause 4 years ago. Irregular bleeding for 3 months.	Path. No. 10793. Squamous cell carc. cervix.	Wide abdom. operation; incomplete.	Disch. March 4, 1907.	Inoperable mass in pelvis, July 15, 1907.
13545. Feb. 1, 1907. (70)	52 years. Colored. 3 preg.; menopause 1 year ago. Irregular bleeding for 8 months. Hg. 40.	Path. No. 10845. Squamous cell carc. cervix.	Wide abdom. operation; very advanced case.	Disch. April 3, 1907.	Death.

TABLE OF CASES OF CARCINOMA OF THE CERVIX OPERATED UPON BY THE MORE RADICAL ABDOMINAL HYSTERECTOMY IN THE GYNECOLOGICAL CLINIC OF THE JOHNS HOPKINS HOSPITAL—Continued.

Gynec. No. Date. Serial No.	Age. Race. Preg. Symptoms.	Path. No. Examination.	Operation.	Immediate result.	Late result.
13555. Feb. 13, 1907. (71)	66 years. White. 1 preg.; menopause 16 years ago. Irregular bleeding for 4 months.	Path. No. 10910. Squamous cell carc. cervix.	Wide abdom. operation; resection of bladder wall and rt. ureter; very advanced case.	Death 15th day, septicæmia; autopsy.	
13929. May 17, 1906. (72)	47 years. White. 2 preg.; menopause 3 years ago. Irregular bleeding since.	Path. No. 9835. Squamous cell carc. cervix.	Wide abdom. operation.	Disch. June 4, 1906.	Death July 6, 1907, from recurrence.
13956. July 8, 1907. (73)	56 years. White. 5 preg.; menopause 7 years ago. Irregular bleeding for 1 year.	Path. No. 11599. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, fair.	Disch. Aug. 14, 1907.	Death May, 1908, from recurrence.
14063. Aug. 6, 1907. (74)	55 years. White. 6 preg.; menopause 18 years ago. Irregular bleeding for 4 months.	Path. No. 11854. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, good.	Disch. Sept. 1, 1907.	March, 1913: No recurrence.
14126. Aug. 27, 1907. (75)	30 years. Colored. 0 preg. Irregular bleeding for 8 months.	Path. No. 11826. Squamous cell carc. cervix; myoma uteri.	Wide abdom. operation. Prognosis, good.	Disch. Oct. 3, 1907.	Not located.
14127. Aug. 26, 1907. (76)	45 years. White. 5 preg. Blood-tinged leucorrhœa for 7 months; pains in hips.	Path. No. 11858. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, good.	Disch. Sept. 23, 1907.	Death May 13, 1909; probable recurrence.
14129. Aug. 29, 1907. (77)	41 years. White. Irregular bleeding for 2 months.	Path. No. missing.	Prelim. curettage; wide abdom. operation.	Phlebitis 11th day (left). Disch. Oct. 6, 1907.	March, 1913: Patient writes, she is in good health, perfectly cured.
14141. Sept. 2, 1907. (78)	58 years. White. 0 preg.; menopause 13 years ago. Irregular bleeding for last 3 years.	Path. No. 11845. Adeno-carc. cervix.	Prelim. curettage; wide abdom. operation.	Disch. Sept. 28, 1907.	Death Feb., 1910, from recurrence.
14236. Oct. 4, 1907. (79)	44 years. White. 1 preg. Constant bleeding for last 9 months.	Path. No. 11898. Squamous cell carc. cervix.	Wide abdom. operation with resection of ureter and bladder; very advanced case.	Death 25th day; cause not given; apparently cardiac complications.	
14325. Nov. 1, 1907. (80)	55 years. White. 0 preg.; menopause 5 years ago. Irregular bleeding for 7 months.	Path. No. 12009. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, good.	Disch. Nov. 24, 1907.	March, 1913: In excellent health.
14388. Nov. 27, 1907. (81)	21 years. White. 0 preg. Leucorrhœa for 6 months; pain over lower abdom. for 3 months.	Path. No. 12086. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, bad.	Disch. Dec. 20, 1907.	Death 18 months after operation, recurrence.
14407. Dec. 2, 1907. (82)	57 years. White. 8 preg.; menopause 2 years ago. Irritating blood-tinged leucorrhœa for 1½ years.	Path. No. 12145. Squamous cell carc. cervix.	Prelim. curettage; wide abdom. operation.	Disch. Dec. 24, 1907.	Death Dec. 8, 1908, from recurrence.
14466. Jan. 6, 1908. (83)	39 years. White. 6 preg. Irregular menses for 3 years; bleeding after coitus for 1 year.	Path. No. 12242. Squamous cell carc. cervix.	Prelim. cauterization 4 days before; prelim. cath. left ureter; wide abdom. operation; very advanced case.	Phlebitis, left; 14th day. Disch. March 20, 1908.	Death July 10, 1908, probable recurrence.
14488. Jan. 11, 1908. (84)	26 years. White. 1 preg. Bleeding following coitus for 4 months.	Path. No. 12182. Squamous cell carc. cervix; metastases to lymph glands.	Wide abdom. operation. Prognosis, bad.	Disch. Feb. 3, 1908.	Not located.
14537. Feb. 3, 1908. (85)	52 years. White. 7 preg. Irregular menses for 1 year.	Path. No. 12294. Squamous cell carc. cervix.	Prelim. curettage and cauterization; wide abdom. operation. Prognosis, good.	Disch. March 12, 1908.	Death Nov. 19, 1909, from recurrence.
14553. Feb. 8, 1908. (86)	27 years. White. 2 preg. Irregular bleeding for 18 months.	Path. No. 12324. Squamous cell carc. cervix.	Wide abdom. operation.	Disch. March 5, 1908.	Not located.
14557. Feb. 10, 1908. (87)	56 years. White. 7 preg.; menopause 11 years ago. Irregular bleeding and watery disch. for 6 months.	Path. No. 12300. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, good.	Phlebitis, left. Disch. March 14, 1908.	March 22, 1913: In excellent health.
14561. Feb. 15, 1908. (88)	45 years. White. Irregular bleeding for 6 months; polyuria and painful defecation for 2 months.	Path. No. 12303. Squamous cell carc. cervix.	Prelim. curettage and cauterization; wide abdom. operation; rectum adherent.	Cystitis. Disch. March 24, 1908.	Death June 4, 1909, probable recurrence.
14597. Feb. 29, 1908. (89)	45 years. White. 5 preg. Constant bleeding for 1 month.	Path. No. 12337. Adeno-carc. cervix; bilateral ovarian carc.	Wide abdom. operation. Prognosis, fair.	Disch. April 13, 1908.	Not located.
14692. April 14, 1908. (90)	42 years. White. 1 preg. Constant bloody disch. for 4 months; profuse bleeding after straining at stool.	Path. No. 12456. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, good.	Disch. April 24, 1908.	Death 3 months later from recurrence.
14824. May 29, 1908. (91)	45 years. Colored. 5 preg. Severe leucorrhœa for 2 months; blood-tinged for 3 weeks..	Path. No. 12636. Squamous cell carc. cervix.	Prelim. curettage and cauterization; wide abdom. operation; incomplete removal.	Disch. July 2, 1908.	Death.
14911. June 27, 1908. (92)	48 years. White. 4 preg. Irregular menses with very profuse bleeding for the last 2 months; polyuria.	Path. No. 12650. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, good.	Cystitis. Disch. July 16, 1908.	March 27, 1913: Excellent health; no recurrence.
14946. June 9, 1908. (93)	45 years. White. 8 preg.; menopause 8 years ago. Irregular bleeding for 1 year.	Path. No. 12812. Squamous cell carc. cervix with pyometra.	Prelim. cauterization; wide abdom. operation; incomplete removal. Prognosis, hopeless.	Disch. Aug. 8, 1908.	Death May 29, 1911; recurrence.
15053. Aug. 20, 1908. (94)	49 years. Colored. 3 preg. Blood-tinged leucorrhœa for 3 months with pain over lower abdom.	Path. No. 12923. Squamous cell carc. cervix.	Prelim. cauterization; wide abdom. operation. Prognosis, good.	Disch. Sept. 12, 1908.	March, 1913: In good health.
15289. Nov. 27, 1908. (95)	55 years. White. 3 preg.; menopause 10 years ago. Blood-tinged leucorrhœa for 2 years.	Path. No. 13267. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, good.	Disch. Dec. 27, 1908.	Death Oct., 1909; probable recurrence.

TABLE OF CASES OF CARCINOMA OF THE CERVIX OPERATED UPON BY THE MORE RADICAL ABDOMINAL HYSTERECTOMY IN THE GYNECOLOGICAL CLINIC OF THE JOHNS HOPKINS HOSPITAL—Continued.

Gynec. No. Date. Serial No.	Age. Race. Preg. Symptoms.	Path. No. Examination.	Operation.	Immediate result.	Late result.
15406. Jan. 13, 1909. (96)	65 years. White. 3 preg.; menopause 10 years ago. Irritating leucorrhœa for 2½ years.	Path. No. 13370. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, good.	Disch. Feb. 2, 1909.	April, 1913: No evidence of recurrence.
15548. March 10, 1909. (97)	58 years. Colored. 9 preg.; menopause 18 years ago. Blood-tinged leucorrhœa for 1 year; pain over lower abdom. for 6 months.	Path. No. 13579. Squamous cell carc. cervix.	Prelim. curettage for diagnosis; wide abdom. operation; very advanced case.	Death 9th day; autopsy, general peritonitis.	
15782. May 24, 1909. (98)	55 years. White. 9 preg.; menopause 10 years ago. Blood-tinged leucorrhœa for 6 weeks.	Path. No. 13840. Squamous cell carc. cervix; myoma of uterus.	Wide abdom. operation; resection of left ureter; very advanced case.	Disch. June 27, 1909.	Not located.
15797. June 5, 1909. (99)	47 years. White. 9 preg. Blood-tinged disch. for 1 month.	Path. No. 13908. Squamous cell carc. cervix.	Wide abdom. operation; advanced case.	Disch. June 27, 1909.	Death.
15872. July 5, 1909. (100)	50 years. Colored. 5 preg.; menopause 5 years ago. Irregular bleeding for 18 months.	Path. No. 14002. Squamous cell carc. cervix.	Prelim. curettage; wide abdom. operation; incomplete removal; very advanced case.	Disch. Aug. 2, 1909.	Feb. 22, 1912: Advanced recurrence.
15939. Aug. 7, 1909. (101)	61 years. White. 1 preg.; menopause 14 years ago. Irregular bleeding for 1 year.	Path. No. 14082. Squamous cell carc. cervix.	Wide abdom. operation.	Disch. Oct. 6, 1909.	Not located.
15976. Aug. 24, 1909. (102)	55 years. White. 3 preg.; menopause 9 years ago. Blood-tinged leucorrhœa for 11 months.	Path. No. 14139. Squamous cell carc. cervix.	Prelim. cauterization; wide abdom. operation. Prognosis, good.	Disch. Sept. 18, 1909.	Death Nov., 17, 1910; recurrence.
15977. Aug. 23, 1909. (103)	50 years. White. 1 preg. Profuse menorrhagia with almost constant sanguineous disch. for 3 years.	Path. No. 14117. Squamous cell carc. cervix.	Prelim. cauterization; wide abdom. operation. Prognosis, good.	Disch. Oct. 16, 1909.	April, 1912, in excellent health.
16104. Oct. 27, 1909. (104)	31 years. White. 2 preg. Irregular bleeding for 4 months.	Path. No. 14365. Squamous cell carc. cervix.	Prelim. cauterization 1 week before; wide abdom. operation; very advanced case.	Disch. Nov. 13, 1909.	Not located.
16112. Oct. 28, 1909. (105)	35 years. Colored. 4 preg. Pain over lower abdom. for 3 months.	Path. No. 14367. Squamous cell carc. cervix; pelvic inflam. disease.	Evacuation of pelvic abscess with removal of part of cervix for diagnosis. Prelim. cath. ureters. Prognosis, good.	Disch. Nov. 14, 1909.	March, 1912: No evidence of recurrence when last seen. Has left the city.
16133. Oct. 26, 1909. (106)	48 years. White. 3 preg. Intermenstrual bleeding for 3 months.	Path. No. 14335. Squamous cell carc. cervix.	Prelim. cath. ureters; prelim cauterization; wide abdom. operation; advanced case.	Disch. Nov. 24, 1909.	Recurrence Sept., 1910.
16152. Nov. 15, 1909. (107)	51 years. White. 8 preg.; menopause 5 years ago. Irregular bleeding for 5 months. Hg. 43.	Path. No. 14418. Squamous cell carc. cervix.	Prelim. cauterization for inoperable carc. Such marked improvement in 2 weeks, growth was removed; advanced case.	Disch. Dec. 7, 1909.	March, 1913: In excellent health; no recurrence.
16176. Nov. 6, 1909. (108)	49 years. Colored. 4 preg.; menopause 4 years ago. Irregular bleeding after straining at stool for 5 months; pain over lower abdom. for 7 months.	Path. No. 14375. Squamous cell carc. cervix; myoma uteri.	Wide abdom. operation; advanced case.	Incision opened on 8th day. Disch. Jan. 4, 1909.	March, 1913: In excellent health.
16206. Dec. 1, 1909. (109)	44 years. White. 3 preg. Irregular bleeding and constant blood-tinged disch. which was irritating for 6 months. Painful urination and defecation.	Path. No. 14743. Squamous cell carc. cervix.	Prelim. cauterization 4 days before; wide abdom. operation; very advanced case.	Death 6th day; probably surgical shock; no peritonitis.	
16298. Jan. 5, 1910. (110)	36 years. Colored. 4 preg. Severe pain over lower abdom. for 2 months.	Path. No. 14561. Squamous cell carc. cervix.	Wide abdom. operation; incomplete removal; very advanced case.	Recto-vaginal fistula. Disch. March 5, 1910.	Not located.
16344. Jan. 26, 1910. (111)	29 years. Colored. 0 preg. Constant bleeding for 2 months.	Path. No. 14641. Squamous cell carc. cervix.	Wide abdom. operation; advanced case.	Recto-vag. fistula. Disch. March 17, 1910.	Not located.
16374. Jan. 27, 1910. (112)	53 years. Colored. 7 preg.; menopause 6 years ago. Severe pain over lower spine with blood-tinged leucorrhœa for 4 months.	Path. No. 14643. Squamous cell carc. cervix.	Prelim. cauterization; wide abdom. operation.	Cystitis. Disch. Feb. 15, 1910.	Death Nov., 1911, from recurrence.
16386. Feb. 14, 1910. (113)	55 years. White. 7 preg.; menopause 3 years ago. Irregular bleeding for 6 months.	Path. No. 14721. Squamous cell carc. cervix.	Prelim. cauterization; wide abdom. operation; removal of gall stones. Prognosis, good.	Disch. March 24, 1910.	Recurrence Sept., 1913.
16462. March 10, 1910. (114)	37 years. White. 5 preg. Pain over lower abdom. for 4 months.	Path. No. 14822. Squamous cell carc. cervix.	Prelim. cauterization; wide abdom. operation. Prognosis, good.	Disch. April 4, 1910.	Not located.
16661. May 18, 1910. (115)	47 years. White. 5 preg. Irregular bleeding for 6 months.	Path. No. 15062. Adeno-carc. cervix.	Prelim. cauterization; wide abdom. operation. Prognosis, good.	Disch. July 8, 1910.	Jan., 1913: In good health; no recurrence.
16699. June 2, 1910. (116)	30 years. White. 1 preg. Irregular bleeding for 5 months. Hg. 65.	Path. No. 15110. Squamous cell carc. cervix.	Prelim. excision for diag; wide abdom. operation.	Cystitis. Disch. June 23, 1910.	Death May 18, 1911, from tuberculosis.
16757. June 22, 1910. (117)	65 years. White. 6 preg.; menopause 15 years ago. Blood-tinged leucorrhœa for 2 months.	Path. No. 15190. Adeno-carc. cervix.	Prelim. cauterization; wide abdom. operation. Prognosis, good.	Disch. July 12, 1910.	March, 1913: In excellent health.
16808. July 23, 1910. (118)	57 years. White. 4 preg.; menopause 10 years ago. Irregular bleeding with irritating leucorrhœa for 10 months.	Path. No. 15256. Squamous cell carc. cervix.	Prelim. cauterization 1 week before; wide abdom. operation. Prognosis, good.	Disch. Sept. 10, 1910.	Recurrence about 6 months later.
16844. Aug. 4, 1910. (119)	52 years. White. 6 preg.; menopause 1 year ago. Constant bleeding for 4 months.	Path. No. 15382. Squamous cell carc. cervix.	Prelim. curettage and cauterization 1 week before; wide abdom. operation; incomplete removal.	Death 15th day; lobar pneumonia.	

TABLE OF CASES OF CARCINOMA OF THE CERVIX OPERATED UPON BY THE MORE RADICAL ABDOMINAL HYSTERECTOMY IN THE GYNECOLOGICAL CLINIC OF THE JOHNS HOPKINS HOSPITAL—Continued.

Gynec. No. Date. Serial No.	Age. Race. Preg. Symptoms.	Path. No. Examination.	Operation.	Immediate result.	Late result.
17027. Oct. 31, 1910. (120)	44 years. Colored. 6 preg. Watery disch. for 2 months, dull, aching pain over lower abdom. for 2 months.	Path. No. 15632. Squamous cell carc. cervix.	Wide abdom. operation. Prognosis, good.	Utero-vaginal fistula on 6th day. Disch. Nov. 18, 1910.	Not located.
17080. Nov. 16, 1910. (121)	47 years. White. 2 preg. Irregular bleeding with profuse watery disch. for 3½ years.	Path. No. 15669. Adeno-carc. cervix.	Cauterization 2 weeks before; prelim. cath. of rt. ureter; wide abdom. operation. Prognosis, fair.	Disch. Dec. 10, 1910.	March, 1913: In good health.
17111. Nov. 19, 1910. (122)	47 years. White. 7 preg. Irregular bleeding for 2 years; dysuria for 6 weeks.	Path. No. 15747. Adeno-carc. cervix.	Cauterization 4 days before; wide abdom. operation.	Death ½ hour later from surgical shock.	
17124. Nov. 30, 1910. (123)	30 years. Colored. 5 preg. Irregular bleeding for 5 months. Hg. 65.	Path. No. 15754. Squamous cell carc. cervix.	Cauterization 1 week before; wide abdom. operation; incomplete removal.	Disch. Dec. 15, 1910.	Death.
17156. Dec. 6, 1910. (124)	27 years. Colored. 2 preg. Irregular bleeding for 5 months.	Path. No. 15770. Squamous cell carc. cervix.	Preliminary cauterization; wide abdom. operation; incomplete removal.	Disch. Dec. 20, 1910.	Not located.
17178. Dec. 13, 1910. (125)	53 years. White. 5 preg.; menopause 9 years ago. Irregular bleeding for 1 year.	Path. No. 15816. Squamous cell carc. cervix.	Curettage and cauterization 2 days before; wide abdom. operation. Prognosis, fair.	Cystitis. Disch. Jan. 13, 1911.	Recurrence April, 1911.
17182. Dec. 17, 1910. (126)	43 years. White. 4 preg. Irregular bleeding for 5 months.	Path. No. 15797. Adeno-carc. cervix extending into fundus.	Wide abdom. operation; resection and implantation of left ureter.	Disch. Jan. 28, 1911.	Death, July, 1911, from recurrence.
17485. May 6, 1911. (127)	49 years. White. 5 preg. Slight bleeding for 7 weeks.	Path. No. 16220. Squamous cell carc. cervix.	Cauterization 3 days before; wide abdom. operation. Prognosis, good.	Entire incision opened spontaneously. Disch. June 13, 1911.	March, 1913: In excellent health.
17549. June 14, 1911. (128)	56 years. White. 10 preg.; menopause 4 years ago. Irregular bleeding for 4 months.	Path. No. 16363. Squamous cell carc. cervix.	Cauterization 2 weeks before; wide abdom. operation; advanced case.	Vesico-vag. fistula on 4th day. Disch. July 15, 1911.	March, 1913: No recurrence; splendid health.
17602. June 25, 1911. (129)	54 years. White. 3 preg.; menopause 8 years ago. Irregular bleeding for 5 months. Hg. 70.	Path. No. 16323. Squamous cell carc. cervix.	Cauterization; wide abdom. operation; very advanced case.	Vesico-vag. fistula 10th day. Disch. July 18, 1911.	Died April, 1912, from recurrence.
17607. June 28, 1911. (130)	45 years. White. 8 preg. Irregular bleeding for 2 months with severe pain over abdom.	Path. No. 16391. Squamous cell carc. cervix. Metastases to ovary.	Prelim. cauterization; wide abdom. operation; advanced case.	.....	Death on 6th day from peritonitis.
17735. Aug. 22, 1911. (131)	45 years. White. 5 preg. Blood-tinged leucorrhœa for 4 months. Hg. 75.	Path. No. 16650. Squamous cell carc. cervix.	Cauterization 2 weeks before; wide abdom. operation; very advanced case.	Recto-vag. fistula. Disch. Oct. 14, 1911.	Recurrence within a few weeks.
17760. Sept. 9, 1911. (132)	28 years. Colored. 7 preg. Irregular bleeding for 8 months. Hg. 38.	Path. No. 16652. Squamous cell carc. cervix.	Prelim. excision for diagnosis; wide abdom. operation. Prognosis, good.	Disch. Sept. 26, 1911.	Feb., 1912, in good health.
17778. Sept. 12, 1911. (133)	58 years. White. 4 preg.; menopause 8 years ago. Profuse vaginal disch. for 2 years.	Path. No. 16654. Squamous cell carc. cervix.	Cauterization; wide abdom. operation.	Disch. Oct. 9, 1911.	Not located.
17894. Oct. 20, 1911. (134)	48 years. White. 3 preg.; menopause 2 years ago. Blood-tinged leucorrhœa for 5 months; severe abdom. pain for 6 months.	Path. No. 16716. Squamous cell carc. cervix.	Prelim. cauterization; prelim. cath. of rt. ureter; wide abdom. operation. Prognosis, fair.	Vesico-vag. fistula on 10th day. Disch. Nov., 1911.	April, 1913: Enjoying the best of health; no recurrence, 1912.
18020. Dec. 2, 1911. (135)	41 years. Colored. 9 preg. Irregular bleeding for 6 months.	Path. No. 16845. Adeno-carc. cervix.	Cauterization; wide abdom. operation. Prognosis, fair.	Death 20th day; pulmonary embolism.	
18033. Dec. 6, 1911. (136)	57 years. White. 4 preg.; menopause 8 years ago. Irregular bleeding for 2 months.	Path. No. 16854. Squamous cell carc. cervix.	Cauterization; wide abdom. operation. Prognosis, Very bad. Incomplete.	Disch. Dec. 22, 1911.	Recurrence 1912.
18053. Dec. 16, 1911. (137)	35 years. Colored. 4 preg. Pain over lower abdom. for 1 year; blood-tinged leucorrhœa for 4 weeks.	Path. No. 16895. Squamous cell carc. cervix.	Cauterization; wide abdom. operation; advanced case.	Disch. Jan. 9, 1912.	Not located.

FURTHER ANALYSIS OF THE SUCCESSFUL OPERATIONS FOR CARCINOMA OF THE CERVIX.

Gynec. No.	Serial No.	Path. No.	Length of time since the operation.		Gynec. No.	Serial No.	Path. No.	Length of time since the operation.	
			Years.	Months.				Years.	Months.
7627	2	3904	11	11	14325	80	12009	5	4
8198	4	....	11	4	14557	87	12300	5	1
8778	10	4077	10	9	14911	92	12650	4	9
9228	13	5436	10	3	15053	94	12923	4	9
10324	25	6443	7	11	15406	96	13370	4	3
10444	27	6680	9	11	15977	103	14117	2	8
10993	31	6837	8	8	16112	105	14367	2	5
10627	33	6885	7	4	16152	107	14418	3	4
11225	37	7467	6	9	16176	108	14378	3	4
11323	39	7601	7	8	16661	115	15062	2	8
11360	40	7602	7	10	16757	117	15190	2	9
12597	53	9362	6	1	17485	127	16220	1	10
12014	57	9812	5	10	17549	128	16363	1	9
12087	60	10242	5	8	17769	132	16652	1	5
14063	74	11854	5	7	17894	134	16716	1	6
14129	77	.....	5	7					

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A BRIEF HISTORY OF THE METHODS OF RESUSCITATION OF THE APPARENTLY DROWNED.*

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Among the various institutions that have been formed for the welfare of mankind, none appear more worthy of our attention than those that are calculated for preserving the human species. In the vast realm of human endeavor perhaps no body of men have been more instrumental in inaugurating a world-wide movement which had for its sole purpose the saving of human life than was the society at Amsterdam, instituted in the year 1767, for the recovery of the apparently drowned.

In the spring of that year a few wealthy and benevolent gentlemen of the City of Amsterdam, struck with the variety of instances in which persons falling into the water were lost for want of proper treatment when brought on shore, formed themselves into a Society for the Recovery of Drowned Persons. From a careful search through the literature, I find that this institution was the first of its kind ever organized, and we shall see later that it became the parent of innumerable similar institutions scattered through the world.

The methods employed in the resuscitation of drowned persons previous to the establishment of this institution, and also those recommended by this society, were based almost wholly upon empiricism, and it was not until some years after the founding of the Royal Humane Society in London, in 1774, that any systematic study was made to disclose the rationale underlying the various methods which were then in use.

The members of the Amsterdam Society pursued their design with so much zeal and success that, in the space of four years, they had the satisfaction to find that, in not less than 150 cases, drowned persons were recovered by the means pointed out and recommended by them in the United Provinces by advertisements and other publications. Their *first* object was to inform the common people, as well as the inferior practitioners of physic, in what manner to treat a person apparently lifeless; and their *second* was to animate them by proper rewards to pursue the methods recommended.

The general instructions published by this society are very interesting. They tell us that

> As soon as the drowned body was found, it was to be conveyed, extended upon a hand-barrow, a ladder, or some long board, to a barn, a shed, or other place under cover, where no house was near enough for its reception. Then it was to be laid out upon a table or bench, in a sloping position, the head higher than the feet; it was then to be stripped, laid in a blanket, and carefully examined to see whether any parts were injured.
>
> The bodies of drowned persons, since they were generally found wet, cold and stiff, were to be immediately well dried, placed in a temperate air, and rubbed with dry and warm flannels or a flesh-brush. If dry rubbing did not soon prove efficacious, then some spirits or coarse salt were to be sprinkled upon the parts and the rubbing resumed; the spirits thus used were the volatile spirit of sal ammoniac, or hartshorn, or *eau-de-luce*, mixed with brandy, rum or malt spirits. The parts to be rubbed with steadiness were the back-bone, the sides of the body, the abdomen and breast, the palms of the hands and soles of the feet; other parts to be chafed with the above-named spirits were the temples, ears and neck. These spirits were not to be applied in profusion.
>
> Since the mouth and nose of drowned persons were often filled with mud or froth, this was to be cleared away with a goose-feather, or by repeated injections of some lukewarm water, tea or aromatic infusion—the body to be laid upon its side, that the liquid might run out.
>
> If a small degree of heat was obtained from the rubbing alone, a recovery then became very promising, and the body was then to be laid in a blanket (or in a bed where it could be had) between two healthy persons, undressed, who were to continue rubbing and gently agitating the body, to increase the heat to a natural state. But if the first degree of heat was not produced by the diligent rubbing, then dry heat was to be added, in bed if possible, by some bottles filled with hot water, and wrapped up in flannel; heated tiles or bricks, so wrapped up, but used with precaution; also hot sand in bags, laid near, but not to touch, the sides, the hands and the feet; and a number of cloths, alternately heated, were to be placed especially about the head, the neck and the coldest parts of the body and renewed as they cooled.

The introduction of air into the body was also warmly recommended. It was practised in two different ways and tended "to blow up the lungs to renew the circulation or to swell the intestines to produce motion." The attempt to fill the lungs was made by the nose, and required a particularly constructed pipe, one end of which fitted the nostrils and the other received the nozzle of a small, clean bellows that was to be worked cautiously and slowly, while the mouth was kept closed and the throat gently pressed back to make the air take its right course down the windpipe and not into that which leads to the stomach. The directions stated that when this operation was well performed it might prove of great benefit, but that it was difficult and without the pipe was scarcely practicable. Further, if the bellows were not at hand, the trial was not to be made with the breath of the operator, which "has become noxious and unfit to enter any lungs again."

The other method was made by the fundament, in which case the bellows could be more easily applied. This latter method was much more frequently used, and it was strongly advised that when common air did not suffice to bring about some signs of life a more stimulating vapor was to be blown up the intestines, such as "the smoke of tobacco for strong bodies, or some aromatic herb, as sage, mint or rosemary, for the weaker sort." It was accomplished as above mentioned by the use of bellows or the so-called fumigator—the operation being commonly spoken of as fumigation. When a fumigator was not at hand, it could be performed very satisfactorily by the use of the common smoking-pipe filled and lighted, the bowl of which was put into a common clyster-bag; or by two

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pipes inverted on each other, and held together by a piece of strong paper, or joined by a kind of tinder-barrel. In the words of the translator,

While the air, vapor or smoke is being introduced into the body, the belly must be gently moved and pressed upward with the hand; and the operation must be repeated and continued for a length of time until signs of life appear. When those are obtained, attention is then required, to go on slowly, and to give heat and motion by degrees but not to overpower, by hasty endeavors, a body then in so weak a condition as to be hurt by every inconsiderate attempt. It should at that time be kept in gentle agitation, by means of the blanket upon which it lies. The nostrils and throat are to be tickled with a crow feather; and powders or salts that provoke sneezing may then be used. The temples, ears and neck are to be chafed with the volatile spirits above mentioned, mixed with brandy or common spirits; some raisin-wine, tincture of castor or peppermint water, or other cordial, ought then to be put into the mouth, by slow degrees, a teaspoonful at a time, and allowed to go down before another is given.

Keith, in his lectures on artificial respiration, remarks that mouth to mouth inflation, a form of artificial respiration, was also somewhat extensively used. The case reports certainly substantiate this statement, though Dr. Johnson, of London, in his account of the Amsterdam Society published about 1785, registers an objection against the method, as I have stated above. In the performance of this method the operator closed the patient's nostrils and applied his mouth to that of the patient and inflated the lungs and expanded the belly and chest. By compressing these parts with his free hand, the operator brought about an expiratory movement. It is most likely that this method had been used for several centuries, though perhaps it was not so often employed by the common people prior to the foundation of the Royal Humane Society.

Regarding the advisability of *venesection* as an aid in resuscitation, I find that there was considerable difference of opinion as to its usefulness, but on the whole most authorities seriously questioned its efficacy; and especially was this true in England during the last two decades of the eighteenth century. The experimental work of A. Fothergill, John Hunter and others clearly demonstrated the ineffectiveness of this method of resuscitation, particularly when practised by the well-intentioned but ignorant laymen, which was only too frequently the case. It was, however, undoubtedly recommended by the Dutch society, though I am unable to substantiate the statement from a perusal of the literature. The reason for such an opinion is the fact that out of sixty cases reported by the Dutch institution and republished later by Johnson, bleeding was attempted in more than 75 per cent of the cases; and quoting from Keith, it was "particularly necessary as life returns."

The society further recommended the use of *emetics* and *stimulants*, both internal and external, as accessory and useful means.

A survey of the case reports shows quite conclusively that various other methods of resuscitation than those I have mentioned had been used by the laity of both England and Europe from very early times. Most of them, however, were crude, dangerous and inefficient. The so-called "*barrel method*" had been practised for many years, and especially among the sailors. In this method the body was simply placed upon the barrel, face downwards, the legs of the patient being grasped by the physician or other assistant and raised to the horizontal, and the body was then rolled forward and backward. If we carefully inquire into the principles underlying this method, we find that it has much in common with a method recently advised by Prof. Schäfer.

Suspension by the heels, or inversion of the body, and merely *rolling the body on the ground* were other methods occasionally employed.

In summary then we may remember the following methods used in the resuscitation of the apparently drowned, possibly before and certainly during the last half of the eighteenth century, and recommended by the Amsterdam Society:

(1) Friction and rubbing of various parts of the body with or without stimulants.

(2) Warmth, in the form of dry heat, or even the "warm bath" in some instances.

(3) Fumigation.

(4) Gentle agitation of the body.

(5) Artificial respiration by bellows and mouth to mouth inflation.

(6) Venesection.

(7) Emetics and stimulants.

Especial importance was placed upon friction, warmth, and fumigation as the most satisfactory and successful of the methods.

The society placed no definite limit upon the time for the continuance of the necessary treatment in any given case; it was to be persevered in, without discouragement, till life be recovered; or till it was plainly evident, from a very long train of fruitless endeavors, that no kind of change was obtained. But the space of six hours or more should at least be occupied to obtain the first sign of life.

I should like to read you the reports of a few of the cases successfully recovered, as they have been translated from the memoirs of the Dutch society. They are indeed interesting and clearly illustrate the methods employed prior to the beginning of the last century.

Case 14.—At Amsterdam, on the 25th of February, 1769, a maid servant, drawing water in the morning, fell into the canal before her master's door, and after some struggling sank to the bottom. She was got out, in about a quarter of an hour, and had not the least sign of life in her. Air and tobacco-vapor were immediately blown up her intestines; she was stripped, was laid before a fire, and was rubbed with cloths dipped in brandy, till some signs of life were discovered, when also some froth appeared upon her mouth. An assisting surgeon's apprentice tried to bleed her, but got no more than a few drops; not being satisfied with this, he opened the jugular vein, and took away eight or nine ounces of blood. As she recovered, fourteen or fifteen drops of spirits of sal ammoniac were given her in water. Some hours afterwards she was put to bed, was rubbed, and had a tobacco-clyster. She was also bled in her right arm, and at length came entirely to herself, yet complained of an oppression in her breast. At noon she was ordered to be blooded a third time. At four in the afternoon, little complaint

remained, but a straitness over her breast, which she had before been subject to, and was afterwards cured.

CASE 15.—At Rotterdam, on the 8th of April, 1769, the daughter of Meindert den Broeder, a girl of ten years of age, fell into a stagnant pool, near the rampart of the town, and stuck in it for some time. When she was taken out of it, she seemed, according to the account of the surgeon Hooykass who directed the following treatment, to be absolutely dead, and looked as black as if she had been hanged, having also a quantity of froth at her lips and nose. She was immediately stripped, put between warm blankets, and rubbed. After the introduction of some tobacco-vapor into the intestines, a bleeding was attempted, and only about four ounces of blood obtained, by drops; the jugular vein not being practicable, upon account of the great swelling of the neck and head. Three persons then continued to rub, and inject smoke, for the space of an hour, when a faint yawning, like that of a departing patient, gave the first small sign of life. Some spirit of sal ammoniac, held to the nose, produced no effect; but in an hour and a half some slight pulsation was discovered; soon after which, she discharged upwards and downwards, and then began to move her legs and arms. At the end of two hours, she began to scream, and cried out, "I am fallen into the water"; and afterwards complained of soreness all over her body. Some cordial was at this time given her, which had before been fruitlessly attempted, and now served greatly to recover her. About an hour and a half afterwards, she complained of a great pain in her bowels, and a difficulty in breathing, for which a clyster with an infusion of tobacco was administered, and it operated in so copious a manner as to give her great relief. An hour and a half after this, she was delirious, and still more oppressed. It was again tried to bleed her, and still without success; but a blister was applied to her back, and was thought to do her good. A laxative medicine was given her by degrees during the night, and had its intended effect. Next morning she had a violent pain in her side, and a considerable oppression, for which recourse was had to bleeding, which at last succeeded on her hand, and immediately relieved her. The next day she voided some hard, black, clayey stuff; the day after that, she complained of a pain in her breast, which was found to proceed from some skin being rubbed off during the operation. Her tongue remained furred for some days, but was at last cleared by a repetition of the laxative medicine; and she then gradually recovered her former strength, to the great comfort and assistance of an old, helpless father, whom this girl took care of, whilst the mother was absent, indefatiguably working as a char-woman for the subsistence of her family.

CASE 17.—At Amsterdam, on the 17th of April, 1769, Anna Woertman, a woman of 27 years of age, belonging to that pleasant part of the city called the Plantage, was taken out of the water without its being known how long she had lain in it. She was inconsiderately rolled upon a float, for a quarter of an hour, and is said to have voided a good deal of water. She was then carried into a house, where Bernardus Donselaar, an apothecary, was sent for, and told she had just before given some very faint sign of life, though in fact she appeared quite lifeless, was stiff, and had green and blue spots all over her body. She was laid before a fire in blankets, and was rubbed with a mixture of spirit of sal ammoniac and essence of rosemary, along the backbone, the loins, the neck, the head and the temples; and a stone jug filled with hot water was laid at her feet. Some farther signs of life then appearing, she began to shake as in the cold fit of an ague, spoke and complained; upon which some spoonfuls of Jeneva were given her, and she was blooded. Her blood was black and thick, not inflamed. As she was thirsty, some milk and water was given her; and then she fell into fits seemingly strong enough to carry her off; these, however, were removed by a cordial administered to her. In the space of four hours and a half she was so much better as to be carried home, and put to bed to her sister, where she fell into a breathing sweat. About five hours afterwards she complained of a great oppression, and a violent pain in all her limbs; for which an aperient laxative mixture was given, which made her part with a quantity of watery matter. The pain augmenting, and fixing in her side and breast, she was twice bled; and her blood being then found much inflamed, it was wished to repeat the bleedings; but she proved to be too weak. However, a blister was applied to her side; and other treatment being opportunely given, she was entirely recovered in the space of a fortnight, the slowness of which is attributed to her having been afflicted six months before with a fever, and to constant depression of spirits, upon account of bad circumstances.

CASE 19.—At Amsterdam, on the 29th of July, 1769, a boy of 14 years of age, called Jacob Voorn, rowing with some others in a boat, fell overboard, and sunk directly. More than 20 minutes elapsed before he could be got out of the water. He was then carried into a house, where, by the direction of Floris Loosjes, an apothecary, he was stripped of his clothes, laid in a blanket, and rubbed all over; tobacco-smoke was blown up into his intestines, and wind forced into his mouth, whilst his nose was held closed; and this was repeated. He was bled at the arm, and nine or ten ounces of blood were taken away; after which, upon the appearance of some signs of life, a little brandy was put into his mouth; and the room in which he was thus treated, being thought too close, he was carried into a more airy room, where, some more brandy being forcibly spouted into his throat, he roused at once, and screamed out. When he became quieter, some milk and water was given him to drink. He was then put to bed, had hot cloths applied to him, and was well covered up. He grew warm by degrees, excepting at the soles of his feet, and was delirious at times; but that ceasing, he complained of a pain and inflammation in his throat, which, by the prescription of a physician, was got the better of in a few days, and the lad was totally restored.

The establishment of this Dutch institution was speedily followed by apparently great success, and the advantages accruing from it to the state induced each of the several provinces of the republic to take proper measures for extending its benefits, by enjoining an observance of the society's directions through their respective districts. Further, the assiduous endeavors made to spread the knowledge of this practice caused its reception and led to the forming of similar institutions in the following countries and cities. From the city of Amsterdam, in Holland, where it took its origin and whence it soon became known throughout the republic and the Netherlands, it found its way southward into Italy, and was received by the boards of health of Venice, Milan and Padua. The King of Naples ordered it to be connected with the purposes of the great infirmary in his capital; his majesty's example was followed in the cities of Florence, Leghorn and Genoa. It was further encouraged by the regency of Hamburg, whence it passed through Germany. The Empress Queen of Hungary gave it protection and directed it to be made known in her extensive dominions, and so it spread throughout all the countries of Europe.

Having briefly considered the methods of resuscitation which were in use upon the Continent during the latter part of the eighteenth century, let us now direct our attention to Great Britain and learn what was the condition of things, relative to our subject, present in that country.

You will recall that the Amsterdam Society was established

in 1767. It was but six years later that we find an Englishman —a Dr. Cogan, a learned and judicious physician of London— had become interested in this Resuscitative Movement, so to speak, and it was in the year 1773 that this gentleman translated the Memoirs of the Dutch Society. This booklet immediately arrested the attention of one of the most remarkable men of London, Dr. William Hawes, and the latter tells us that it was Dr. Cogan who first fired him with the purpose of introducing into London the methods practised by this Amsterdam institution. His one object was to allure the advocates of humanity and of science to the discussion and investigation of this very important cause, and we need not go far to find that his purpose was completely realized. Thus, this resuscitative movement, as we may now call it, reached England in 1773 in the persons of Dr. Cogan and Dr. Hawes.

On the 18th of April, 1774, in the London Coffee House, these two men and a score or more of other friends founded the Royal Humane Society. It is of historical interest to recall that such names as David Garrick, Oliver Goldsmith, John Hunter, A. Fothergill, Frederick Bull, Lord Mayor of London, James Horsfall, Heberden, Lettsom, Beaumont, Parkinson and many others appear in the Transactions of this society as officers, members and supporters. Dr. Hawes and Dr. Cogan were the institutors of the society and the former was its leading spirit until his death in 1808.

I think we may say with all truthfulness that the early history and development of the methods of resuscitation are in reality the history and development of this institution. It was through its influence that the problems surrounding the resuscitative art were thoroughly, systematically and scientifically investigated, and through these researches a great many facts of scientific and practical value which had hitherto been inexplicable came to be common knowledge.

The methods advocated by this English society were similar in many respects to those recommended by the Dutch institution. Their directions stated that the restoration of heat is absolutely essential to life, and therefore they emphasized particularly the application of warmth. Artificial respiration and especially fumigation were quite extensively used in the manner described above. Agitation was similarly recommended. "One or more persons should take hold of the legs and arms and vigorously shake the body, which procedure could be repeated by the assistants several times within the hour, if necessary." They further directed that if one hour had elapsed, "and there be no signs of animation, and any brewhouse or bakehouse be in the neighborhood, the body should be placed in warm grains, or ashes, little exceeding that of healthy persons. If so fortunate as to obtain a warm or vapor bath, it should be employed in conjunction with the other modes of resuscitation."

In addition to the Dutch methods, the society stated that electricity would increase the beneficial tendency of the restorative means. "The electrical shock," says Mr. Kite, "is to be admitted as the test of any remains of animal life; and, *so long* as that produced *contraction,* the person may be said to be in a *recoverable* state; but, when that effect has altogether ceased, there can no doubt remain of the party being absolutely and positively dead." Dr. A. Fothergill observed, "where the vital organs are sound and only *their motion* suspended, why not have immediate recourse to the most *potent stimulus* in nature, which instantly pervades the inmost recesses of the animal frame? Why not immediately apply *electrical shocks* to the heart and brain, the grand sources of motion and sensation of the animal machine?"

Venesection, though it was frequently used by physicians and others in their attempts at resuscitation, was strongly opposed by the Royal Humane Society.

Upon the solicitation of the officers of the society, and especially of Dr. Hawes, many investigations were made by the most renowned scientific men of that day to determine the efficacy of the various treatments then employed, and it was also hoped that from the results of their work new methods, simpler and more effective, might be discovered. Within the next twenty-five of thirty years numerous monographs appeared regarding the effectiveness of the various methods employed for restoring drowned people. It is quite beyond the limits of this paper to enter into any detailed analysis of these various experimental data, and I shall venture to give you a very brief résumé only of the more important of these contributions.

It was indeed a circumstance of no small triumph to the Royal Humane Society, that the practicability of the resuscitative art, obtained by its exertions, first drew the attention of these great men to investigate its theory.

In 1776 Dr. William Cullen, Professor of Physic at the University of Edinburgh, upon the solicitation of Dr. Hawes began his experimental study. This gentleman begins his judicious publication by defining "*The Vital Animal Principle,*" which he makes to consist in "that disposition or condition of the nerves and muscular fibers, by which they are rendered susceptible of irritability and sensibility, conjoined with a due organization of the parts." It seemed to him, therefore, a fair and reasonable inference to draw this conclusion: that the action of the heart and lungs, the circulation, and consequently all the functions of life, though they have long ceased, may be restored. The numerous and well-attested facts of persons recovered, who had for a long time exhibited "all the exterior signs of death," he thought, corroborated the validity of this opinion.

The author proceeds farther to observe that, as dissections show that seldom either the lungs or the stomach in drowning receive so much water as could possibly injure the system, it is probable that the death, which ensues or seems to ensue, is entirely occasioned and owing to respiration being interrupted, and the circulation of the blood, in consequence, ceasing, whereby the body very soon loses its "*natural heat,*" and the "*vital principle*" therewith its activity.

If there can be means found to restore this "*natural heat*" and "*vital activity,*" there will be a possibility, and almost a certainty, of restoring drowned persons. The results of his experimental work led him to recommend warmth as probably the most efficacious means. He also advised stimulants per

anum—preferably tobacco-smoke—inflation of the lungs by the use of the bellows, blood-letting and emetics.

A few years later John Hunter investigated the subject. His researches dealt chiefly with the influence of the lungs upon the heart. This ingenious physiologist begins by dividing violent deaths into three kinds:

First, when a stop is put to the action of life in the animal, but without any irreparable injury to a vital part.

Second, where an injury is done to a vital part.

Third, where absolute and positive death instantly takes place in every part.

He was of the opinion that drowning most commonly comes under the first; and upon that basis he professed principally to consider the subject of the drowned.

Hunter further observes that *privation of breathing* appears evidently to be the *first cause of death*, and the *ceasing of the motion of the heart*, the *second* or *consequent*. He therefore argues that most probably the restoration of the pulmonary action is all that appears necessary to restore the motion of the heart; for, if sufficient life still exists to produce that effect, we may reasonably suppose every part equally ready to move, the very instant the *action of the heart* takes place, their actions and motions depending so much upon it. Mr. Hunter attempts an illustration of the propriety and justice of this conclusion by considering what happens at the birth of children, when too much time has intervened between the interruption of that life which is peculiar to the foetus and that which depends on breathing. In such cases, there being a total suspension of the actions of life, the child remains to all appearances dead, and would certainly die if air were not thrown into its lungs, and by such means the first principle of action restored.

To the same purpose the author quotes the results of one of his earlier experiments upon dogs. He constructed a pair of double bellows and connected it to the dog's trachea in such a manner that he could by one action throw fresh air into the lungs, and by another suck out again the air which had been thrown in by the former, without mixing them together. By working the bellows the dog was kept perfectly alive. While the artificial respiration was going on, the dog's sternum was taken off, and the lungs and heart exposed; the heart continued to act as before, only the frequency of its action was considerably increased. The motion of the bellows being stopped, the heart became gradually weaker, and less frequent in its contractions, until it ceased entirely to move. By renewing the action of the bellows the heart again began to move, at first very faintly, and with long intermissions; but by continuing the artificial breathing, its motion became as frequent and as strong as at first.

Mr. Hunter repeated this experiment ten or twelve times, sometimes stopping for five, eight, or ten minues. Every time he left off working the bellows, the heart became extremely turgid with blood, the blood in the left side becoming as dark as that in the right, which was not the case when the bellows was working. He considered the animal to exhibit exactly the same conditions here as in drowning. He concluded that what the drowned person needed most of all was air, fresh air, and what was still better, the so-called *dephlogisticated air* or oxygen, which had but recently, 1774, been discovered by Priestly and Lavoisier.

The results of further experimental work led him to recommend, in addition to artificial respiration by bellows, etc., warmth, stimulants, forced movements and electricity. He was one of the few strong opponents to the use of tobacco-smoke as an efficacious means of restoring the apparently drowned, and likewise condemned the use of the lancet and emetics.

In 1781-85, Dr. A. Fothergill undertook experimental investigation, and his recommendations were in the main quite similar to those of Hunter. He observed that in all cases of suspended animation the grand intention of the operator should be to excite the latent principle of irritability, on which the motion of the vital organs immediately depends. Although this principle remains a considerable time after the lungs are quiescent, yet it never can be restored to its activity until that organ is again put in motion. His experience showed that this could be often effected by blowing air into the windpipe, and that renewing pulmonary action was one great step toward restoring the energy of the heart, the brain, and the arterial system, and consequently of the other subordinate springs of the animal machine. He was convinced that inflating the lungs was probably one of the most efficacious methods of restoring animation; and he felt that dephlogisticated air was undoubtedly more serviceable than ordinary air.

The other improved methods which he ventured to suggest were the "electrical shock" and heat; and these, together with oxygen, were in his opinion the most powerful agents in nature that should be employed in the resuscitation of the drowned.

Regarding electricity he writes as follows:

> **Whoever considers its effects in increasing the action of the heart and arteries, in accelerating the circulation of the blood, and consequently in promoting the progressive motion of all the animal fluids, will scarcely hesitate to acknowledge it as a suitable agent for restoring suspended animation.**

In his dissertation on "Heat—Its Efficacy in Restoring Animation," we find this interesting paragraph:

> **When the warm bath cannot be speedily procured, a *partial application* of heat may prove very beneficial. Hence a warm sunshine has, more than once, afforded a useful auxiliary on these occasions. This circumstance might be improved, when the weather is favorable, by collecting the solar rays in the focus of a lens or speculum, and directing them with more or less intensity upon different parts of the body. By thus directing the concentrated rays, with due caution, on the eye, the pupil would not fail to contract, if the muscular fibres of the iris retained even the smallest degree of irritability. Might not this mode of application afford a method of discovering whether any remnant of life yet remained in the other parts of the body, and lead us to a new criterion between real and apparent death?**

A. De Haen, Professor of Medicine in Vienna, did important experimental work on dogs. These experiments were concerned chiefly with the drowning and subsequent resuscitation of the animals. He was probably the first to state the fact that water entered the lungs during drowning, and he therefore recommended the inversion of the body and other means for

expressing the water from the lungs, in addition to the other methods already in use.

E. Goodwyn, experimenting about 1782, was the first to discover that the tongue might fall back and thus occlude the opening into the larynx.

It is interesting to trace the fate of some of these various methods of resuscitation; for example, the use of the bellows. This method had long been in use by anatomists and physiologists in keeping animals alive during experiments, and it appears to have been first used on a human being by Dr. John Fothergill, of London, about 1750. It is also known to have been employed by the laity during the middle part of the eighteenth century. The bellows was first recommended by the Royal Humane Society in 1782 and for some 35 or 40 years no word was registered against it. It was Leroy of France who, in 1829, showed that it was possible to kill an animal by suddenly inflating its lungs and also to produce emphysema of the lungs and pneumothorax in dead animals. He found that from 20 to 80 mm. Hg. pressure was sufficient. The fact which damned the use of the bellows was Leroy's statement that the lungs of those on whom inflation had been unsuccessfully performed were frequently emphysematous. It was not until the publication of Paltauf's memoir in 1888 that emphysema was recognized as a consequence of drowning. As a result of Leroy's statement the use of the bellows fell into disgrace as a method of resuscitation.

Sir William Brodie was also instrumental in relegating the bellows to the past. In 1821 he stated dogmatically that there were few cases of drowning in which artificial respiration would prove of any service. His reason was that in from two to three minutes after respiration had ceased, the heart stopped, and when that occurred artificial respiration was powerless to restore it. It was of use only when it could be applied before the heart had stopped, and such cases generally recovered without assistance.

Because of these statements and Leroy's work, artificial respiration was regarded as an altogether secondary measure in the restoration of the drowned.

The history of the method of fumigation illustrates how quickly and how unreasonably a method at one time extensively used may fall into disrepute. It was undoubtedly used for many years before the foundation of the Royal Humane Society, and was employed successfully for some 35 years following the organization of this institution. Three experiments conducted in 1811, by Brodie, then only about 28 years old, brought the practice to an abrupt close. He discovered that four ounces of a strong infusion of tobacco injected into the intestines was sufficient to kill a dog in from eight to ten minues, and that one ounce could kill a cat. Nicotine was a cardiac poison. During the previous 35 years the method had been found to succeed in hundreds of cases and had been warmly recommended by such authorities as Cullen, Cogan, Ward, Dixon and Hawes. Three crude experiments by a young surgeon were sufficient to overturn 35 years of experience.

We now come to what may be designated as a new era in the resuscitative movement. I refer to the introduction of *mechanical expansion and compression of the chest wall* as a new method in recovering the apparently drowned. Dr. Marshall Hall was really the founder of this method, though artificial movements of the chest had been intentionally practised before this time. It was Leroy of France, in 1829, who observed that the bellows, in the hands of an ignorant operator, might become a dangerous weapon and proposed in its stead a method of artificial respiration quite like that introduced by Howard some 40 years later. This method consisted in laying the patient face upwards and compressing the anterior wall of the abdomen and thorax, thus producing expiration, inspiration resulting from the elastic rebound of the chest wall.

The first systematic attempt to deal with this subject, however, was that of Dr. Marshall Hall, of England. In 1857 this learned physiologist published his paper entitled, "Prone and Postural Respiration in Drowning." The method is known as the Marshall Hall or the *ready* method, the latter proposed because no apparatus of any kind was required.

Hall carried out a series of very ingenious experiments, from which he concluded that the condition of drowning was one of anæsthesia and poisoning by a surcharge of carbon dioxide. He also found (as Goodwyn had pointed out 70 years before) that when the patient was supine the tongue and larynx were apt to fall back and occlude the air-passage. When the patient was placed in the prone position, this difficulty was avoided. Briefly, his directions were as follows:

(1) Treat the patient *instantly, on the spot,* in the *open air,* freely exposing the face, neck and chest to the breeze, except in severe weather.

(2) Send with all speed for medical aid, and for articles of clothing, blankets, etc.

(I) To clear the throat:

(3) Place the patient gently on the face, with one wrist under the forehead. (All fluids and the tongue itself fall forward, and leave the entrance into the windpipe free.)

(II) To excite respiration:

(4) Turn the patient slightly on his side, and

(a) Apply snuff or other irritant to the nostrils, and

(b) Dash cold water on the face, previously rubbed briskly until it is warm.

If there be no success, lose no time, but—

(III) To imitate respiration:

(5) Replace the patient on his face.

(6) Turn the body gently, but completely, *on the side and a little beyond,* and then on the face, alternately, repeating these measures deliberately, efficiently, and perseveringly, 15 times to the minute *only.*

(7) When the prone position is resumed, make equable but efficient *pressure along the spine* and lower thorax, removing immediately before rotation on the side.

(IV) To induce circulation and warmth:

Continuing these measures,

(8) Rub the limbs *upwards,* with firm pressure and with energy, using handkerchiefs, etc.

(9) Replace the patient's wet clothing by such other covering as can be instantly procured.

From time to time—

(V) To again excite inspiration:

(10) Let the surface of the body be slapped briskly with the hand; or

(11) Let cold water be dashed briskly on the surface, previously rubbed dry and warm.

Hall strongly advised against the removal of the patient, as involving dangerous loss of time; against the use of the bellows, or any forcing instrument, and the warm bath, stating that they were positively injurious. Galvanism and the inhalation of oxygen he regarded as useless. The inhalation of ammonia he thought might be of some value.

In analyzing this method, we find that the essence of it consists in altering the position of the patient from a lateral to a prone posture, the supposition being that with these changes in the position of the body alterations would be produced in the capacity of the thorax, the front of which, in the prone position, would sustain the weight of the trunk and would thus be somewhat compressed, while in the lateral position the more movable front of the thorax would be relieved of pressure and would tend to resume its original volume by virtue of its elasticity. It should be added that the weight of the trunk is, in this method, assisted in the task of forcing air out from the thorax by pressure between the shoulder blades and over the lower chest when the body is in the prone position, and it may further be added that this pressure tends considerably toward the efficiency of the method. The gaseous exchange effected by this method was found to vary from 70 cc. to 240 cc.

The records show that this method was followed with great success for many years. It was adopted in England by the Royal Humane Society and by the National Life Boat Institution and was, and still is, taught and practised by both these bodies, and has also, until lately, been the common method employed in the Royal Navy.

In the following year, 1858, Dr. H. R. Silvester worked out a method of artificial respiration on quite a new principle. His aim was to imitate as nearly as possible the natural movements, and especially the raising of the ribs. He selected the supine posture. His experiments were conducted upon the dead body. With the object in mind of raising the ribs, he advocated the pulling of the arms forcibly above the head, thereby dragging upon the ribs by means of the pectoral and other muscles passing between the arms and the thorax, and so effecting an enlargement of that cavity by the elevation of the ribs. Expiration in this method is brought about by lowering the arms again to the sides and then compressing the thorax laterally. By this mechanism it was conceived that a large amount of air-exchange might be obtained, and most experimenters agreed that the Silvester method was the most effective one in producing an ample ventilation of the lungs. A respiratory tide varying from 300 cc. to 500 cc. could often be produced, but it was a laborious method and effective only when applied expertly.

Both this and the method of Marshall Hall were submitted in 1862 by the Royal Medical and Chirurgical Society to the investigations of a committee which made a number of experiments upon the cadaver. As a result of their report (which was quite inconclusive), however, the Silvester method was put in the first place by the Royal Humane Society and was adopted as an alternative method by the National Life Boat Institution. It was also taught, along with others, by the Royal Life Saving Society, when that society was established in 1891, and it has now for many years been the method chiefly employed in Great Britain and in many parts of Europe for the resuscitation of drowned persons.

In 1869, Dr. Benjamin Howard, of New York, published the description of another method, which depended, not upon traction or posture, but upon pressure alone. In his plain rules Dr. Howard first instructs you to turn the patient face downward and press two or three times with all your weight upon the back, so as to press the water out of the lungs and stomach; then to turn the patient face upward and (after producing overextension of the spine by placing a support under the patient, so as to make the subcostal margin prominent) kneel over the lower part of the body, placing a hand over each prominent subcostal margin so that the fingers occupy the furrows between the ribs above the margins, the palms below them. When pressure is applied by the operator placing his weight over his hands, expiration is produced by a triple movement; first, the lower six ribs are depressed; second, the abdominal contents, especially the liver and spleen, are compressed so as to force upwards the diaphragm and empty the lungs; and third, the extension of the spine is partly undone. The pressure is relieved by a sudden jerk backwards, and the spine again becomes overdistended, the lower ribs again become prominent, and the viscera slowly return to the position of rest. Inspiration is thus effected by the rebound. This operation is to be repeated from 10 to 12 times per minute.

This method differs from the Marshall Hall method, not only in employing pressure as the main active agent in effecting air exchange, but also in the position of the body. In this respect the Howard method resembles the Silvester method, the patient in both instances being laid on the back, with a roll of clothing under the shoulders. In the Marshall Hall method the position is never supine, but is alternately prone and lateral. This is a very important practical difference, especially in drowning cases, for in such cases there is apt to be a considerable accumulation of watery mucus, and in the supine posture, with the head thrown back this will accumulate in the throat and obstruct the passage of air. An even greater disadvantage is the tendency of the limp and swollen tongue of the drowned subject to fall back and obstruct the air passage when in the supine posture. It is clear, therefore, that even if efficient in producing air exchange, both the Silvester method and the Howard method are contra-indicated in cases of drowning. The above objections do not apply to the Marshall Hall method; but on the other hand it is doubtful if the rolling of the patient on his side, which was looked upon by Marshall Hall as the essence of this method, adds greatly to its efficiency.

The most recent method which has been advocated for the resuscitation of the drowned was introduced in 1903 by Prof. E. A. Schäfer, and his work undoubtedly is one of the most

important contributions ever made to the literature of resuscitation. His technique was far more exact than that of previous investigators, and his experiments were made in a most thorough and scientific manner. He employed modern graphic methods, which, with few exceptions, had not been previously used. It is to this illustrious investigator that we owe an accurate knowledge of the large amount of water which may pass into and be absorbed by the lungs; the small amount of air expired in the act of drowning; the standard method of estimating efficiency by stating the amount of air exchanged, not with each movement of the chest, but in a given time—the five-minute standard; and a new process of artificial respiration—the Schäfer method. Further, he employed the living instead of the dead human body as the subject of many of his experiments. In studying the effects of drowning, dogs were used. The living human body was made use of to test the efficiency of the various methods of artificial respiration.

He found the amount of water sucked in during complete or partial submersion had no relation to the weight or size of the animal, and the amount was also found to vary greatly—varying from 75 cc. to 690 cc. Nor was there any relationship found between the possibility of recovery by artificial respiration and the amount of water taken in. If the animal was removed immediately after drowning, very little water was found in the lungs—it was found to be absorbed into the blood nearly as fast as it was taken in.

Schäfer observed that "the physiological phenomena of drowning are a form of the phenomena exhibited in all cases of asphyxia. They are modified, however, by the reflex effects of the contact of the water with the sentient surfaces of the skin, larynx and air passages; and these show themselves most markedly by a primary inhibition of respiration, which commonly occurs, as well as by an early and persistent tendency to cardiac inhibition. Contact of the water with the air-passages leads also to an increased secretion of mucus, and may offer an insuperable obstacle to the passage of air into or out of the alveoli and render futile any attempt at artificial respiration."

The tracings made by Schäfer show that the most common phenomena relating to the respiration are the following:

(1) An initial cessation (holding of the breath), which may last some 20 seconds.

(2) When resumed, the respirations are slow and may be irregular, but are deeper than normal and tend to increase in depth and slowness as asphyxia progresses. They are sometimes moderately slow and regular for a minute or two, and then become much slower; usually they cease somewhat abruptly.

(3) The total cessation of respiration takes place a variable time after immersion—sometimes in less than two minutes, sometimes not until five or six minutes, but usually in about three or four minutes; during these times water is being passed in and out of the air-passages.

With regard to the circulation, the most prominent features were found to be:

(1) A preliminary fall of arterial pressure, mainly due to cardiac inhibition, but vaso-dilatation was also a factor.

(2) An arrest of this fall, followed, in spite of greatly increased inhibition, sometimes by an actual rise of pressure, the arterioles constricting.

(3) A final fall of pressure, with increased slowing of the heart-beat. Sometimes this was accompanied by a gradual weakening of the beat; in these cases the blood-pressure fell steadily, coming down nearly to zero; the heart continuing to beat, with less and less force, for one or two minutes, in one case for as long as four and a half minutes, after cessation of respiration.

Schäfer found that the most effective method of resuscitating the animals after drowning was the compression of the thorax and abdomen either in the supine or in the prone position. In the former, occasionally he observed post mortem that the liver had been ruptured, with extravasation of blood into the abdominal cavity. In fact, this accident has been known to happen in the human subject after employment of artificial respiration in the supine posture.

There was great variability in the results of artificial respiration after drowning in the dog, even when the method employed was calculated to exchange a normal amount of air. As a general rule, if respiration had just ceased and the heart was still beating steadily, artificial respiration would restore life. But if the heart stopped simultaneously with the respiration or suddenly ceased soon after, the prospect of recovery was smaller.

Another point which was accentuated in these experiments was the limited time, after cessation of natural respiration, within which artificial respiration was likely to be effective. If more than two minutes was allowed to elapse after the natural respirations had ceased, failure to recover the animal was nearly always the result, even if the heart was still beating. The time, therefore, at one's disposal for the resuscitation of a drowned subject is measured out in small fractions of a minute; and it is no exaggeration to say that every second is of importance, and that no time should be employed in loosening clothing or in any preliminary operation, but that in all cases artificial respiration should be commenced without one instant's delay.

Schäfer and his assistants measured the gaseous exchange which occurred in the live human subject during artificial respiration by the methods of Silvester, Hall and Howard and found that by none of these methods could they produce as large an amount as by a new method which Schäfer suggested.

In this method, which he calls the "Prone Pressure Method of Artificial Respiration," the subject is allowed to lie prone, *i. e.*, face downwards. The operator kneels on one side of the subject, facing the head, and places his hands, close together, flat upon the back of the subject over the loins, the fingers extending over the lowest ribs. By now leaning forwards upon the hands, keeping the elbows extended, the weight of the operator's body is brought to bear upon the subject, and this not only compresses the lower part of the thorax but also the abdomen against the ground, the pressure being fairly equably

distributed. The result of this is that not only is the thorax diminished in extent from before back, but, owing to the pressure which is communicated to the abdomen, the viscera are compressed and tend to force the diaphragm up, so that the thorax is diminished in capacity from above down. This is no doubt the reason why the pressure method, when applied in the prone position, is more effective than when applied in the supine position as in Howard's method. The pressure is applied not violently, but gradually, during about three seconds, and is then released by the operator swinging his body back, but without removing his hands. The elasticity of the chest and abdomen causes these to resume their original dimensions, and air passes in through the trachea. After two seconds the process is again commenced, and is continued in the same way, the operator swinging his body forwards and backwards once very five seconds, or about 12 times a minute, without any violent effort and with the least possible exertion."

Experience has shown that a single person can employ this method without becoming fatigued or exhausted, which is not true of some of the other methods; and further, it is a very simple method and needs hardly to be taught. The reason why this method of Prof. Schäfer's is to be recommended in preference to any other method thus far described lies in its many obvious advantages, chief among these being the following:

(1) Ease of carrying out the method.
(2) Efficiency of gaseous exchange.
(3) Extreme simplicity of the procedure.
(4) Impossibility of the air-passages being blocked.
(5) No risk to organs (liver, etc.).

Many objections have been registered against the method by such men as Bowles, Silvester and others; but up to the present time there is little doubt but that Prof. Schäfer's method is the simplest and most efficient one for the resuscitation of the apparently drowned. It has recently been adopted by the Royal Life Saving Society to the exclusion of any other, and undoubtedly this decision will result in the saving of many lives which would surely be sacrificed by the employment of the comparatively complex methods hitherto practised, since these require special training and in some cases considerable muscular power to carry out, and some, at least, are of doubtful efficacy.

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THE GREAT IRISH CLINICIANS OF THE NINETEENTH CENTURY.*

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When, a few days ago, I read a draft of the Home Rule Bill which the British government has introduced in Parliament, I wondered what the great medical worthies whose lives I have been studying would say if they were to reappear on the world's stage. They lived at a time when the tragic muse had not tears enough to bewail the fate of Ireland; at a time when the passions engendered by the Act of Union were still burning fiercely; at a time when the two great Churches—each preaching the doctrine of love of fellow man—were hating and reviling each other in a manner that beggars description. When I read of some of the things that were done by the one to the other I could scarcely believe that I was reading of the nineteenth century; they imitated savages so faithfully!

I have an idea that of all the men whose story concerns us—Corrigan, Stokes, Graves and Cheyne—Graves alone would be actively interested in the great events in his country's history.

* Read before the Medical History Club of Philadelphia, and in part before the A. M. P. O. Medical Fraternity.

He impresses me as the greatest of this quartet, a man loyally wedded to his profession, yet with wide human interests. Graves all his life was in sympathy with the ancient philosopher who said, "Nihil humanum a me alienum puto." Stokes was a scholar, a good observer, with esthetic tastes, but not caring much for the great political questions that stirred his contemporaries. Occasionally he utters an altruistic platitude, but it it evident that his heart was not deeply moved. He was opposed to Home Rule, though he welcomed the Catholic Emancipation of 1829. As to Corrigan, it is difficult to ascertain how he stood in the critical days of Irish history. Belonging to what was at that time the unpopular faith in Ireland, though held by the majority, his official biographer of an opposite faith has done him scant justice. When I come to speak of his medical work, I shall have to break a lance in his behalf.

The fourth of the group was not an Irishman at all, but a Scotchman with the typical characteristics of that strong, yet sentimental race. His sympathies were evidently with the ruling powers, for he received high honors from them—no less a one than that of physician to His Majesty's forces in Ireland, a most distinguished post.

If they were to come to life, Graves and Corrigan would surely side with Redmond and Asquith, Stokes probably not. As for Cheyne, he, as we shall see, did everything with a motive. He was shrewd and calculating, and might have espoused Home Rule in Dublin and opposed it in Belfast. Perhaps I am doing his memory an injustice, but thus he has impressed me in his remarkable autobiography.

When we consider these men in their medical relations, one of the things that strikes us is the remarkable circumstance that the city of Dublin should have contained, at nearly the same time, four great luminaries. Yet it is not strange when we reflect that in the glorious days of Pericles there walked the streets of Athens men like Aeschylus, Thucydides, Phidias, Sophocles, Anaxagoras and Socrates. Graves and Stokes, and to a lesser degree Corrigan and Cheyne, made Dublin the third medical city in the world, Paris being first and Edinburgh second; and even Edinburgh at that time did not have a comparable galaxy. Dublin had not been heard of before, nor has it been heard of since. In our day few Americans go there, and they only for the vast experience obtainable in the great Rotunda Hospital; but in the first half of the nineteenth century it drew men from this and other countries who were eager to walk the wards of the Meath Hospital with Graves and Stokes, or the Harwicke Fever Hospital with Cheyne, or the small infirmary in Jervis Street presided over by Corrigan. By a curious coincidence, the volume of lectures by Graves which I consulted in my reading, and which I show you here, was purchased in Dublin by Moreton Stille, a graduate of the University of Pennsylvania and a brother of Alfred Stille, the famous professor of medicine in our university a generation ago. Moreton Stille went to Dublin for postgraduate study, and, though he did not remain there long, finding the opportunities offered by Vienna, where the great Skoda was at his zenith, more attractive, he acquired a high regard for both Graves and Stokes. These two were almost the only physicians in the English-speaking world that were practising real bedside teaching. I cannot help thinking of Marion Sims, who was graduated in Philadelphia about the same time, or a few years earlier, without having ever seen a patient at close range. His graphic account of his experience when called to see a little child, his first patient, should be interesting to the students of our day who practically live in the wards of hospitals in their senior year.

It is difficult to say who deserves the greater credit, Graves or Stokes, for the introduction of bedside teaching. Graves was the older and probably the pioneer. Strictly speaking, Graves was not the first to do clinical teaching. Francis Bond preceded him in this country, and the great Boerhaave in Leyden. The first official attempt at clinical teaching, after the dissolution of the Aesculapian schools, had been made even earlier, in 1578, in the Hospital of St. Francis at Padua, by Albert Bottoni and Marc Oddo (Renouard, Histoire de la Médicine, Paris, 1846, p. 309). That practical bedside teaching, however, was in vogue more than eighteen hundred years ago appears from the following lines from Martial:

> Languebam, sed tu comitas protinus ad me
> Venisti centum, Symmache, discipulis.
> Centum me tetigere manus Aquilone gelatae,
> Nec habui febrem; Symmache, nunc habeo.
>
> I'm out of sorts, but Symmachus is here,
> His hundred pupils following in the rear;
> All feel my pulse with hands as cold as snow,
> I had no fever then—I have it now.

Graves' merit consists in having given the students opportunity to make routine observations of patients assigned to them, for reports of whose conditions they were held responsible. He was the first to break down "the impassable gulf which in that aristocratic era lay between the student and the teacher." His method in many respects is that in vogue in the best medical schools to-day.

GRAVES.

Robert James Graves (1796-1853) is the Trousseau of Ireland, a splendid observer, a brilliant lecturer, a fascinating writer. No man appreciated his qualities more than Trousseau himself, as may be seen in the following excerpt from a preface written by him to the French translation of Graves' lectures:

> For many years I have spoken of Graves in my Clinical Lectures; I recommend the perusal of his work; I entreat those of my pupils who understand English to consider it as their breviary; I say and repeat that, of all the practical works published in our time, I am acquainted with none more useful, more intellectual; and I have always regretted that the Clinical Lectures of the great Dublin practitioner had not been translated into our language. . . .
>
> As Clinical Professor in the Faculty of Medicine of Paris, I have incessantly read and re-read the work of Graves; I have become inspired with it in my teaching; I have endeavored to imitate it in the book I have myself published on the Clinique of the Hotel-Dieu; and even now, although I know almost by heart all that the Dublin Professor has written, I cannot refrain from perusing a book which never leaves my study. . . .
>
> Although a clinical observer, he loves the accessory sciences; we see him frequently having recourse to physiology, in the domain of

which he loves to wander; to chemistry, with which he is acquainted, which he estimates at its true value, and to which he accords a legitimate place. . . .

Graves is, in my acceptation of the term, a perfect clinical teacher. An attentive observer, a profound philosopher, an ingenious artist, an able therapeutist, he commends to our admiration the art whose domain he enlarges, and the practice which he renders more useful and more fertile.

Graves' name is of course enshrined forever in the name Graves' disease, whether justly or not, I have not time to discuss. Nearly every country claims for some favorite son the honor of having first recognized the disease: England for Parry, Italy for Flajani, Germany for Basedow; and even in this country we have a possible claimant. Graves' original account is as follows:

I have lately seen three cases of violent and long-continued palpitation in females, in each of which the same peculiarity presented itself, viz., enlargement of the thyroid gland; the size of this gland, at all times considerably greater than natural, was subject to remarkable variations in every one of these patients. When the palpitations were violent, the gland used notably to swell and become distended, having all the appearance of being increased in size, in consequence of an interstitial and sudden effusion of fluid into its substance. The swelling immediately began to subside as the violence of the paroxysm of palpitation decreased, and during the intervals the size of the gland remained stationary. . . . The palpitations have in all lasted considerably more than a year, and with such violence as to be at times exceedingly distressing; and yet there seems no certain grounds for concluding that organic disease of the heart exists. In one, the beating of the heart could be heard during the paroxysm at some distance from the bed—a phenomenon I had never before witnessed, and which strongly excited my attention and curiosity. . . . The enlargement of the thyroid, of which I am now speaking, seems to be essentially different from goiter in not attaining a size at all equal to that observed in the latter disease. Indeed, this enlargement deserves rather the name of hypertrophy. . . .

A lady, aged twenty, became afflicted with some symptoms which were supposed to be hysterical. This occurred more than two years ago; her health previously had been good. After she had been in this nervous state about three months, it was observed that her pulse had become singularly rapid. This rapidity existed without any apparent cause, and was constant, the pulse being never under 120, and often much higher. She next complained of weakness on exertion, and began to look pale and thin. Thus she continued for a year, but during this time she manifestly lost ground on the whole, the rapidity of the heart's action having never ceased. It was now observed that the eyes assumed a singular appearance, for the eyeballs were apparently enlarged, so that when she slept, or tried to shut her eyes, the lids were incapable of closing. When the eyes were open, the white sclerotic could be seen to a breadth of several lines, all round the cornea. In a few months, the action of the heart continuing with unceasing violence, a tumor, of a horse-shoe shape, appeared on the front of the throat and exactly in the situation of the thyroid gland. This was at first soft, but soon attained a greater hardness, though still elastic. From the time it was first observed, it has increased little, if at all, in size, and is now about thrice the natural bulk of the fully developed gland of the female after the age of puberty. It is somewhat larger on the right side than on the left. A circumstance well worthy of notice has been observed in this young lady's case, and which may serve to throw light on the nature of this thyroid tumefaction. The circumstance I allude to is that from an early period of the disease a remarkable disproportion was found to exist between the beats of the radial and of the carotid arteries, those of the former being comparatively feeble, while those of the latter were violent, causing a most evident throbbing of the neck, and accompanied by a loud rustling sound. In about fourteen months the heart presented all the signs of Laennec's passive aneurysm; the tumor in the neck is subject to remarkable variations in size, sometimes diminishing nearly one-half. None of her family have had goiters, nor was she ever in any of the usual localities of the disease.

In his Clinical Lectures Graves deals with general rather than with special subjects, while Stokes confines himself to diseases of the heart and lungs, and fever. Graves made a careful study of the epidemiology of cholera, and in a voluminous essay discusses the outbreak in England and elsewhere in the old world, and in the United States, taking his information about the latter from an article by a famous Professor of Medicine in the University of Pennsylvania, Samuel Jackson. Graves was the first to show clearly that cholera travelled, and travelled only along lines of human contact. "The results of this study of the epidemic led Graves to a suggestion, the importance of which to the well-being of the human race it would be hard to overestimate. Referring to our ignorance of the laws of epidemics, he proposed, with the view of determining these still hidden laws, that the different civilized governments of the world should unite in the wide establishment of medical observatories, in which, always in connection with a complete system of meteorological observation, careful records should be kept of the rise, progress, and character of disease, whether endemic or epidemic." It took the cholera 20 years to encompass the earth, while influenza, he remarks, "often traverses the same space in a few months."

Graves was a great traveller and a remarkable linguist. On one occasion when on a pedestrian journey in Austria, having neglected to carry his passport, he was arrested as a spy and thrown into a dungeon. His assertion that he was a British subject was disbelieved by the authorities, who insisted that no Englishman could speak German as he did. In his imprisonment, which lasted ten days, he suffered great privations.

Unlike Stokes, he had a keen sense of humor, as the following extract from one of his letters reveals. While in Rome he found sleeping difficult, due to the presence in all bed-rooms "of a certain animal which, together with the culices and ranae palustres, may have robbed Horace of a night's rest on the journey to Brundusium. A friend of mine was so tormented by their bites that when visiting the capitol he flung, in a fit of rage, thirty of the ringleaders headlong down the Tarpeian rock."

Toward his patients he was exceedingly kind. He denounced the practice prevailing in France and in Ireland of discussing hopeless cases in the presence of the patients. I find that our present method of bedside teaching is at times conducive to the same reprehensible practice that so outraged Graves' sense of propriety. Students, when asked to give their opinion of the nature of a case, often use terms understood by the laity—cancer, tuberculosis, Bright's disease—forgetting what a terrible effect such a word may have on the mind of the patient. These terms should never be employed within the hearing of the sick.

Graves' achievements in medicine apart from his discovery

of exophthalmic goiter are many, but none gives him greater claim to immortality than the part he took in revolutionizing the treatment of fevers. Up to his time fever patients were starved. Graves insisted that such patients must not be allowed to suffer from starvation. He says:

In a patient laboring under fever and a protracted abstinence, whose sensibilities are blunted and whose functions are deranged, it is not at all improbable that such a person will not call for food, although requiring it; and if you do not press it on him, and give it as a medicine, symptoms like those which arise from starvation in the healthy subject may supervene. . . . You may, perhaps, think it unnecessary to give food, as the patient appears to have no appetite, and does not call for it. You might as well think of allowing urine to accumulate in the bladder because the patient feels no desire to pass it. You are called upon to interfere where the sensibility is impaired, and you are not to permit your patient to encounter the terrible consequences of starvation because he does not ask for nutriment.

Stokes, in his sympathetic biography, quotes the following story:

Graves was going round the hospital, when, on entering the convalescent ward, he began to expatiate on the healthy appearance of some who had recovered from severe typhus. "This is all the effect of our good feeding," he exclaimed; "and lest, when I am gone, you may be at a loss for an epitaph for me, let me give you one, in three words: 'He fed fevers.'" *

Graves was largely responsible for the opium treatment of peritonitis, which proved so valuable and was extensively employed up to the period when peritonitis ceased to be a medical disease and became a surgical affection.

His ideas on the subject of tuberculosis were far in advance of his time and are practically those universally adopted to-day. He writes thus (Clinical Lectures, New Sydenham Society, Vol. 2, p. 118):

Make your patient lay aside slops and tea and let him take wholesome fresh meat, bread and good beer. He should rise early and breakfast early, let him dine, also, early. When the weather permits, let him remain in the open air four or five hours, taking exercise on a jaunting car or on the top of a coach. Never abandon cases of consumption.

The best climate for the treatment of consumption, in his opinion, is that of the East and West Indies, South Carolina, Florida, the northern states of South America or Egypt.

As I have said before, Graves was deeply interested in the political events of his time, especially in the Hungarian Revolution and in Great Britain's Asiatic policy, which he studied with the zeal of a responsible diplomat. He was interested in art and did some painting. On a journey in Italy he formed a friendship with the artist Turner that had a great influence upon his life. A curious anecdote is told of their first meeting. They travelled together for months, enjoying each other's company, sketching side by side, without either inquiring the name of his comrade, and it was not until they reached Rome that Graves learned that his companion was the great artist.

STOKES.

William Stokes (1804-1878) came of a long line of distinguished men. He was an indolent youth, fonder of reading poetry and romance, especially the tales and ballads of Sir Walter Scott, than of Latin and mathematics. His son tells how he was roused from his lethargy:

One day, while in his favorite retreat, he fell asleep but shortly afterwards was awakened by some warm drops falling on his face. He started up and saw his mother bending over him. Her tears had awakened him. Stung with remorse at having been the cause of so much suffering, his nature appeared to undergo a complete and salutary change, and the dreamy, indolent boy suddenly became the ardent, enthusiastic student.

He had no college training, but was educated by his father and private tutors. After taking courses in chemistry in Glasgow he matriculated in the Edinburgh Medical School, where he fell under the spell of Dr. Alison. Alison must have had a marvelous personality, judging by what Stokes and another pupil, Acland, say about him. While yet a student, Stokes wrote a small volume on the use of the new and much ridiculed instrument called the stethoscope,* and to him is due much of the credit for popularizing Laennec's great invention. Returning to Dublin, he was at once elected physician of the great Meath Hospital in the place of his father, who had resigned. Here he became the colleague of Robert James Graves, with whom he worked side by side in friendly relationship for nearly thirty years. In 1842 he was chosen Regius Professor of Physic in succession to his father, who had held the same chair. At the height of his career, Graves having died, he was probably the ablest physician in Europe. Diseases of the heart and lungs especially interested him, and there are few chapters in these subjects that he has not enriched. He understood better than his contemporaries, better even than the school of Laennec and than many of his successors, that the murmur is not everything either in the diagnosis or in the prognosis of diseases of the heart, and that a functional diagnosis is of more importance than an anatomic one. It is comforting to the student and the practitioner to read of the modesty of a man who had studied heart murmurs better than probably any man since his day—barring perhaps the elder Austin Flint. In one place he says:

We read that a murmur with the first sound, under certain circumstances, indicates lesion of the mitral valves. And again, that a murmur with the second sound has this or that value. All this may be very true, but is it always easy to determine which of the sounds is the first, and which the second. Every candid observer must answer this question in the negative. In certain cases of weakened hearts acting rapidly and irregularly, it is often scarcely possible to determine this point. Again, even where the pulsations of the heart are not much increased in rapidity, it sometimes, when a loud murmur exists, becomes difficult to say with which sound the murmur is associated. The murmur may mask not only the sound with which it is properly synchronous, but also that with which it has no connection, so that in some cases even of regularly acting hearts, with a distinct systolic impulse, and the back stroke with the second sound, nothing is to be heard but one loud murmur. . . .

So great is the difficulty in some cases, that we cannot resist altering our opinions from day to day as to which is the first and which the second sound.

* These words are, however, not on his tombstone.

* The attitude of the medical profession toward the stethoscope in the early days of its use is well illustrated in Oliver Wendell Holmes' poem, "The Stethoscope."

Stokes was one of the first to urge a definite required course of gymnastics or pedestrian exercise in the treatment of heart disease. His ideas on tuberculosis were remarkable, considering how inadequately he knew the pathology of the disease. He believed in the curability of phthisis even after excavation has formed. (Diseases of the Chest, p. 474.) His treatment in its essentials differed but little from that in vogue to-day. The patient was first put to bed and then was allowed to be about, taking exercise in mild weather and afterwards removing to a milder climate to perfect his recovery.

In a case with cavity (Diseases of the Chest, p. 474), yet in which the symptoms and signs are not progressive, the patient's best chance I believe to be the use of a seton, and travelling. If he does not recover, his life will be probably prolonged. He should take as little medicine as possible; he should adopt all strengthening means, and use such a regimen as experience points out as the best. Heated rooms, cough mixtures, acid draughts, inhalations, narcotics, repeated counter-irritation, and all the varied and harrassing treatment which ignorance supposes to be curative, these are not the means of recovery.

The association of his name with the peculiar type of breathing called Cheyne-Stokes breathing, and with a strange malady of the heart—slow pulse and cerebral symptoms—Adams-Stokes disease, will assure him an easy immortality. The respiratory symptom was first observed by Cheyne (Dublin Hospital Reports, Vol. 2, p. 217) in a case of fatty degeneration of the heart. I shall refer to this later on. The Adams-Stokes syndrome was first noticed by Robert Adams, a surgeon, in 1827, but Stokes's careful analysis of Adams's case, as well as his own observations, makes him virtually the real discoverer. The condition is characterized by repeated attacks of syncope, pseudoapoplexy, convulsions, and permanently slow or irregular and feeble pulse.

The original account of Adams' disease appeared in a paper on "Cases of Diseases of the Heart Accompanied with Pathological Observations," in the Dublin Hospital Reports, 1827, IV, 353, and is as follows:

An officer in the revenue, aged 68 years, of a full habit of body, had for a long time been incapable of any exertion, as he was subject to oppression of his breathing and continued coughing. In May, 1819, in conjunction with his ordinary medical attendant, Mr. Duggan, I saw this gentleman; he was just then recovering from the effects of an apoplectic attack, which had suddenly seized him three days before. He was well enough to be about his house, and even to go out. But he was oppressed by stupor, having a constant disposition to sleep, and still a very troublesome cough. What most attracted my attention was, the irregularity of his breathing, and remarkable slowness of the pulse, which generally ranged at the rate of 30 a minute. Mr. Duggan informed me that he had been in almost continual attendance on this gentleman for the last seven years; and that during that period he had seen him, he is quite certain, in not less than 20 apoplectic attacks. Before each of them he was observed, for a day or two, heavy and lethargic, with loss of memory. He would then fall down in a state of complete insensibility, and was on several occasions hurt by the fall. When they attacked him, his pulse would become even slower than usual, his breathing loudly stertorous. He was bled without loss of time, and the most active purgative medicines were exhibited. As a preventive measure, a large issue was inserted in the neck, and a spare regimen was directed for him. He recovered from these attacks without any paralysis. Œdema of the feet and ankles came on early in December; his cough became more urgent, and his breathing more oppressed; his faculties, too, became weaker.

In one respect Stokes, so advanced a student of cardiac and pulmonary diseases, was reactionary and hopelessly conservative, namely in his attitude toward fever. A word that we now use in the sense of a symptom, he and his contemporaries employed as the name of a disease. And so we read of fever, its symptoms and treatment, as we read to-day of pneumonia. At first this is somewhat confusing, but the matter becomes clear when we realize that the fevers known in Ireland were chiefly typhus and intermittent malaria. The Irish typhus stood a close second to emigration in decimating the population of Ireland; for many years it had epidemic exacerbations, as for instance in 1847-48, about the time of the great famine, during which it caused frightful devastation, even among physicians. Stokes, good pathologist that he was in regard to diseases of the heart, believed in the essentiality of fever and looked upon anatomic lesions as accidental and unimportant complications. This view naturally caused him to consider typhus fever and typhoid fever, which also occurred in Dublin, one and the same disease, an opinion which he maintained until his death in 1878. When one remembers that in 1837 Gerhard and Pennock, in Philadelphia, clearly showed that typhus fever without intestinal lesions and typhoid fever with intestinal lesions, the *fièvre typhoïde* or *dothiénentérite* of the French, were totally distinct diseases, and that Lombard of Geneva a year earlier had made the same claim, one realizes how averse Stokes was to changing his opinion. This was no doubt due to his conservative character. As he himself says, "There is nothing more difficult than for a man who has been educated in a particular doctrine to free himself from it—even though he has found it to be wrong." Even intermittent fever was to Stokes merely a variety of fever, a typhus variant, and not a distinct entity. Certainly this tenacity of view is remarkable, as his death occurred only two years before Laveran's discovery of the *Plasmodium malariæ*.

Stokes's ideals of medical ethics were of the highest. The following are some of the principles laid down by him. They need neither explanation nor emphasis:

Never, when brought in as a consultant, declare the nature of a disease in the absence of the medical attendant.

Never hold that you have any property in a patient; be tolerant with the sick in their restless desire to seek other advice; preserve your independence; eschew servility.

As regards conduct in society, never allude to your success in practice. Be silent when quackery is discussed. Be tolerant when those who converse on medicine, while ignorant of its foundation, reject legitimate medicine.

Never originate discussion on medical topics in conversation. As regards conduct toward the profession, consider first the patient, second your professional brother, lastly yourself. Be reticent, lest by a casual word upon the previous treatment of the case, you inflict a stab in the dark on your brother's reputation.

When patients come from the country, never ignore their local attendant, only correspond with them through him.

Do not communicate any fresh discovery in the case that you may make, without communicating such first to him.

Make no change of treatment without writing your opinion to him. Have no professional quarrel.

Like a wise physician, Stokes had his non-medical hobbies. He was fond of music, a student of Shakespeare, a lover of art and an art critic, and an archeologist of no mean ability. By reason of these cultural interests his home was the meeting-place of the intellectuals of Dublin and in it all the distinguished visitors to the city were entertained. On one occasion Carlisle spent an evening at Stokes's house. Perhaps because of his unconquerable Hibernophobia, Carlisle was anything but pleased with his visit, while Stokes pronounced Carlisle not only a bore, but a hyperborean.

The writings of Stokes are voluminous, but of them all the work on the Heart and Aorta and those on Diseases of the Chest are, and will remain, medical classics. His fame would be greater if he had not written his monograph on Fever. Many were the honors conferred upon him. The one he prized the most was the *Ordre pour le Mérite*, bestowed upon him by the German Emperor in 1876. His biographers say he was elected a member of the National Institute of Philadelphia. I have searched in vain for this institute. The name cannot refer to the American Philosophical Society or the Academy of Natural Sciences, of neither of which was Stokes a member.

CORRIGAN.

Sir Dominick Corrigan (1802-1880) is known to all of us through the Corrigan pulse. His article on permanent patency of the aortic valves, in the Edinburgh Medical and Surgical Journal for 1832, written only seven years after his graduation, is a masterpiece and a classic. Although historians say that he was not the first to describe the condition, Vieussens and Hodgson having preceded him, there is no doubt that his description is the best even to this day, and that justice is not outraged by preserving his name in connection with the disease. It is a remarkable fact that Corrigan studied the condition clinically and pathologically in an institution where he had but six beds. As Walsh says ("The Irish School of Medicine," Johns Hopkins Hospital Bulletin, September, 1906):

He did not visit his hospital merely to see patients, but to study the cases carefully. His success is only another example of the necessity for seeing much, and not many things, if there is to be any real progress. In our day, physicians scarcely consider that they have any hospital experience unless they are attending physicians to several hospitals, seeing at least one hundred patients a week. The result is that patients do not receive the skilled care they should, and that advance in medicine suffers because of the wasted opportunities for clinical observation while a busy attending physician rushes through a ward and the resident physician has only time for the routine work that enables him to keep just sufficiently in touch with the progress of his cases to satisfy the hurrying chief physician.

Corrigan's writings are few. Aside from articles in journals, all I have found is a small monograph on Fever published in Dublin in 1853. Like his contemporaries, he believed in the primary nature of fever and looked upon anatomic lesions as secondary results and not as essential parts of the process; but unlike Stokes and Graves, he differentiated much more clearly ordinary typhus from what he called insidious typhus or follicular enteritis, which is our typhoid. I am inclined to think Corrigan was not well-read in the literature of his time, for he seems to have had an open mind which would have been quickly guided aright by a study of the works of others, especially those of Gerhard and Pennock. To that extent I agree with his biographer, Norman Moore, although I think the latter is too severe in his general judgment that Corrigan is a much overrated man. The monograph on Fever shows clear insight and sound judgment, and his attention to details in treatment is admirable. In some conditions his practice was truly heroic, as when he advised blistering the entire abdomen for tympanites. Like the great George B. Wood, he was a believer in turpentine, which he gave in large doses for the same condition. A few years ago the medical profession was startled by the announcement that quinine in large doses was a cure for pneumonia. A number of articles have been written on this supposedly new discovery, yet Corrigan in 1856 (Dublin Hospital Gazette, 1856, III, 177) advocated the same treatment.

CHEYNE

I have chosen to include John Cheyne (1777-1836) in the list of the great Irish clinicians. As a writer he has no claim to be placed on a par with the others. But as a great practitioner, a good observer, and a generally remarkable man, his life is worthy of a little study. I have said he was a Scotchman, the son of a Leith physician whom he began to assist in leeching and bandaging at the tender age of 13. He was sent to the medical school in Edinburgh at 16, too young, he himself confesses, and was graduated at 18 by the aid of a "grinder." Under the inspiration of Sir Charles Bell he became absorbed in pathologic studies and in diseases of children. But he did not find Edinburgh a congenial field for practice. On looking about for a new location, he observed that in Dublin the medical profession was highly respected, and so he settled there. His method of study was one that on many occasions I have adjured my own students to follow. When he observed a well-marked case of a disease, or when an epidemic broke out, he studied the best monograph obtainable on the subject.

Cheyne early in his career endeavored to become acquainted with the characters of those who moved in the highest ranks in the profession, hoping by discovering the cause of their success to follow in their footsteps. Nevertheless, practice in Dublin was slow in coming to him. The few friends he had advised him to go into company and to give entertainments to those who had it in their power to advance his interests. At last he yielded—reluctantly he says—but finding that his own circumstances did not permit of return entertainments for others, he refused to repeat the experiment. After his election to the Meath Hospital and to a lectureship in the College of Physicians, his practice grew by leaps and bounds. In 1816, six years after coming to Dublin, it amounted to £1710 or about $8600, and soon reached an average of £5000 or $25,000, which it maintained for ten years. Being of a weak constitution, he was obliged to circumscribe his practice by refusing to go a distance from Dublin or to undertake attendance upon patients

in the country. He was sure that had his health permitted he could have added £1500 to his income, making it $32,500 a year. Considering the purchasing power of money in the year 1820, Cheyne must have had a practice that is equalled by few living physicians in the United States.

Many of his statements, in their frankness and their shrewdness, remind one of Benjamin Franklin's autobiography. I cannot do better than to quote a few characteristic paragraphs which very clearly show Cheyne's diplomacy, as well as insight into human nature.

> As I was much more generally employed as a consulting than as an attending physician, I endeavored to escape interruption in my chief line of business. I returned to my home at appointed times to form new engagements, but I left no account of my route when I set out from home. When I was tracked and obliged to yield to an unexpected requisition, the patient for whom I was sent was perhaps dead; or he was dying and I was unable to leave him; or the attack was over and he was again well, and my sole recompense was a complimentary speech; or I was led to supersede the family physician engaged elsewhere, which gave rise to explanations, and to a negotiation to replace him in attendance. In the meantime, disappointment to those patients and their medical friends who were waiting for me necessarily occurred, and thus a ruffle of the spirits, very unfavorable to the consideration of a difficult case, arose and continued for hours.

He always observed punctuality, which was not practised in Ireland, yet nowhere regarded with more complacency.

> When a case of disease was assuming an unfavorable aspect, and when the question was mooted, "To whom shall we apply for further help?" it has, in a multitude of instances, been decided in my favor solely by the consideration that I would appoint the earliest hour for the meeting, and that I might be expected to appear within five minutes of the appointed time. . . .
>
> I always endeavored to prevent changes of the medical attendants in a family unless in cases of obvious neglect or ignorance; and even then I never hinted at a substitute. If requested by a patient to recommend a surgeon, accoucheur, or apothecary, to attend in his family, I mentioned the names of three or four men of established character, and advised my patient to discuss their merits with his friends, and decide at his leisure. . . .
>
> I was much employed in the families of my brethren. I found this a painful distinction. . . .
>
> It must, however, be admitted that professional success, like every other good thing in this life, has in its nature many seeds of decay. The same circumstances which tended to bring the present favorite into general repute are probably already operating in behalf of his destined successor. Thus, the physician to whom his fellow-citizens award the possession of the most skill is generally called upon to assist when all assistance is too late, and sarcastic remarks tending to promote his downfall are made when the patient dies and becomes the subject of ephemeral talk.

Cheyne's writings are few. The most important, aside from his autobiography, is the article to which I have already referred, in which he described the arythmic breathipg known as Cheyne-Stokes respiration. The following are his words:

> For several days (the patient's) breathing was irregular; it would entirely cease for a quarter of a minute; then it would become perceptible, though very low; then by degrees it became heaving and quick; and then it would gradually cease again. This revolution in the state of his breathing occupied about a minute, during which there were about 30 acts of respiration. ("A Case of Apoplexy in which the Fleshy Part of the Heart was Converted into Fat," Dublin Hospital Reports, 1818, II, 216.)

At the end of his forty-ninth year he became affected with a species of nervous fever. He continued working until 1821, when failing health compelled him to give up work, at a time when his income had reached phenomenal proportions. He retired to Sherrington, a country village of England, devoting himself to a modicum of practice and a large amount of religious contemplation. He does not state the nature of his disease; but as he had a cataract and gangrene in the lower extremities, it is fair to infer that he had diabetes, possibly also arteriosclerosis.

I am at the end of my essay. The four men of whose lives I have told you something all had remarkable personalities, which would win renown for them if they were living to-day. Without the advantages of the microscope, the thermometer, the blood-counting apparatus, and the numberless devices that aid us in the diagnosis and treatment of disease, they accomplished a great deal, enough to make them immortal, by the aid of their sense of touch and of hearing. Are we not making a mistake in our day by relying too much on instruments of precision? Can we not take a lesson from these men and train our powers of observation as they did? There are many undiscovered clinical facts—perhaps diseases—which another Graves and another Stokes, coming after us, will see. Then his contemporaries will wonder why we of the twentieth century were so blind.

A REVIEW OF THE LIFE OF SIR HANS SLOANE, BART., M. D.*

By JOSEPH T. SMITH, M. D.

"We are much beholden," says Bacon, "to Machiavelli and others that wrote what men do and not what they ought to do"; we are beholden to those who have written about Sir Hans Sloane, for his life was full as well as rich in those activities which are for the uplift of humanity. He has left deep and lasting footprints on the sands of time.

His father, Alexander Sloane, settled in Ireland at the head of a Scotch colony sent out by James I and was made receiver-general of taxes. His mother, Sarah, was the daughter of the Rev. Dr. Hicks, chaplain to Archbishop Laud. Hans, the seventh son, was born in Killyleah, County Down, Ireland, April 16, 1660.

Hans was so delicate in his early life that he had to forego the sports and pastimes indulged in by the boys of his age. When he was 16 he had an attack of hæmoptysis and for three years was in very poor health. At that time he gave up the use

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of wines and beer and lived a temperate life. Jardine says he took as his maxim "That sobriety, temperance and moderation are the best preservatives that nature has vouchsafed to mankind," and he adhered to those principles throughout a long life. Edwards says that his sickness served to strengthen the prudential elements in his character. It is not often that we find men turning their sicknesses to account and learning from them how to live.

He came to London at the age of 18. Staphorst was his teacher in chemistry, and he studied botany under Magnol and Tourneyfort. It was while at the "Jardin des Plantes" that he had Tourneyfort as his companion; in this garden he found a much wider field than any that could be availed of in England and, full of interest and enthusiasm over the new treasures spread out before him, he made the best use of his opportunities.

He studied medicine in Paris, where he had the advantage of having Du Verney as his anatomical instructor, and in Montpelier. In 1683 he received the degree of doctor of medicine from the University of Orange, and in 1701 the same degree from Oxford. After his graduation he came to London and took up his residence with Sydenham. This noted physician gave him the most active support and exerted his influence in introducing him into practice.

Two years after his graduation, in 1685, he was elected a member of the Royal Society, and four years after, in 1687, a Fellow of the College of Physicians. It is remarkable that one so young should have been elected to membership in these societies, and it was doubtless due to his preliminary training under men who, being in the advance guard of progress, stimulated his natural abilities in the right way.

In 1687, four years after graduation, and with the brightest outlook for a large and influential practice, he left London and joined the suite of the Duke of Albemarle on a trip to Jamaica, under the following conditions: "If it be thought fit that Dr. Sloane go as physician to the West Indian Fleet, the surgeons of all ships must be ordered to observe his directions. . . . . He proposes that six hundred pounds, per annum, be paid to him quarterly, with a previous payment of three hundred pounds, in order to his preparation for this service . . ." He was on the island fifteen months and in that short time gathered 800 new species of plants. This collection he gave to John Ray, who, in writing his noted work, the History of Plants, used very extensively the material he had received from Dr. Sloane. During his visit, the rich and the poor called upon him for medical advice; this he always gave freely and heartily, treating all who called him with equal consideration and taking nothing from the poor. On one occasion he was taken sick, and he says: "I had a great fever, though those about me called it a little seasoning." Writing about an earthquake, he says: "Ever since the beginning of February I dread earthquakes more than heat. For then we had a very great one. Finding the house to dance and the cabinets to reel, I looked out of the window to see whether people removed the house (a wooden structure) or no. Casting my eyes towards an aviary, I saw the birds in as great concern as myself. Then another terrible shake coming, I apprehended what it was and betook me to my heels to get clear of the house; but before I got down stairs it was over."

In addition to Jamaica he visited Madeira, Barbadoes, Nieves and St. Christopher. He invested largely in Peruvian bark, as that was a very lucrative article of commerce, and made good use of it financially and medically. He has this to say of a dolphin which was caught and cooked: "Dry, though pretty good victuals, and well tasted; the nearer the head the more it is prized, although I am apt to think that if this fish, so much commended by sailors, was ashore in a market where other fish were to be had, it would not be counted so great a delicacy." He says in regard to his entertainment by the Governor of Barbadoes: "For my own part, I liked so well the dessert after dinner, which consisted of shaddocks, guavas, pines, mangrove, grapes, and other unknown fruits in Europe, that I thought all my fatigues well bestowed when I came to have such a pleasant prospect."

In 1696 he published an elaborate catalogue in Latin of the plants he had collected in Jamaica, which gave rise to much criticism, Leonard Plukenet, a learned botanist, attacking it. In 1707 he published the first volume of his book entitled "A Voyage to the Islands Madeira, Barbadoes, Nieves, St. Christopher and Jamaica, with the Natural History of the Herbs, and Trees, four-footed Beasts, Fishes, Birds, Insects, Reptiles &c. of the last of those Islands: to which is prefixed An Introduction wherein is an account of the Inhabitants, Air, Waters, Diseases, Trades &c. of that place, with some Relations concerning the Neighboring Continent, and Islands of America." . . . "Many shall run to and fro, and knowledge shall increase." Dan. xii: 4. The second volume did not appear until 1724, for the reason, as the author states, that "A multiplicity of business in the practice of physic, which I esteem one of my first cares and must be minded if the lives of persons be regarded with due attention to the several symptoms and changes of their diseases." Dr. Pulteney says: "They exhibit proof of the author's veracity, which I conceive it is difficult to parallel in any other work." The account of the Irish potatoes is interesting. Dr. Sloane says: "Many live on the Irish potatas, a sort of Solanum, on which, I have heard, they live in the mines of Potosi and in Ireland. . . . The root is tuberous; for shape and bigness very uncertain; but being for the most part oblong; as big as a hen's egg from a swelled middle tapering to both extremes; yellow and sweet within; when roasted, tasting like a boiled chestnut, and having many fibrils by which it draws its nourishment. . . . In four months after planting they are ready to be gathered, the ground being filled with them, and if they continue therein any longer, they are eaten by worms." He brought home a live snake and says: "Thus it lived for some time, when, being weary of its confinement, it shoved asunder the two boards on the mouth of the jar, and got up to the top of a large house, wherein lay footmen and other domestics of her grace the Duchess of Albemarle, who being afraid to lie down in such company, shot my snake dead." Dr. Pulteney says: "The voyage of Dr. Sloane was productive of much benefit to science by exciting an emulation both in Britain and on the Continent. . . . Several circumstances concurred, re-

specting the voyage of Dr. Sloane to Jamaica, which rendered it peculiarly successful to Natural History. He was the first man of learning whom the love of science alone had led from England to that distant part of the globe . . . "

In 1693 he was made secretary of the Royal Society and editor of the Philosophical Transactions. The editorship he held for twenty years. Edwards says: "The Philosophical Transactions of the Royal Society owe a great deal to Sloane; upon the death of the editor, Oldenburg, a diminution of the income of the Society and some personal disagreements in the Council Board impeded their publication, but Sloane bestirred himself and steadily and persistently built up the Transactions. He frequently gave prominence to medical subjects in the Transactions, so much so as to arouse complaint. . . . If Sloane, in his day, occasionally made scientific men somewhat more familiar with medical subjects than they cared to be, he did very much to make medical men aware of the peculiar duty under which their profession laid them of becoming also men of true science. It was one of the minor, but memorable results of the establishment of the Royal Society that it tended powerfully to lift medical practice out of the slough of quackery."

In 1700 Sloane was made the subject of a satirical pamphlet which appeared under the title "Transactioneer with some of his Philosophical Fancies." Trivial in itself, it nevertheless led to discussions which left their marks upon the Society for a long time. Sloane thought a member of the council, a Dr. Woodward, the author; this the doctor denied, but indorsed the satire. The ill-feeling lasted a long time. "The petty discussion came to a height when Sloane chanced to make some passing medical comment on the words the 'bezoar of gallstone' . . . Sloane's casual remark drew from Woodward the offensive words, 'No man who understands anatomy would make such an assertion.'" Again he interrupted Sloane by exclaiming: "Speak sense or English and we shall understand you." Friends tried to enlist the president on Woodward's side by reminding him that he had often been patient under the medical dissertations, but Newton replied: "For a seat in the council a man should be a moral philosopher as well as a natural one." Woodward was removed as a member of the council, but Dr. Sloane sought a speedy reconciliation.

In 1686 Dr. Sloane was opposed to Halley for assistant secretary of the Royal Society. On the first ballot there was no election, and Sloane lost on the second. Sir Hans thus had his troubles in that great Society. In 1727 he succeeded Sir Isaac Newton as president of the Royal Society, retiring from it at the age of 80.

In 1694 he was made physician to Christ's Hospital; he gave all his salary to its foundation and retired after thirty years' service.

In 1705 he was elected censor of the College of Physicians and was re-elected in 1709-1715. In 1719 he was elected president of the College of Physicians, and he remained in office 16 years. In the College of Physicians he warmly promoted the plan of a dispensary for the sick poor; this met with much opposition from the apothecaries. He advanced £700 to the college and later gave it £100.

In 1708 he was elected a foreign member of the French Academy of Sciences and shortly afterwards a member of the Imperial Academy of St. Petersburg and of the Royal Academy of Madrid.

In 1729 a very unique and interesting Epistolary Letter was published from T—— H—— (Thomas Hearne) to H——s S——e (Hans Sloane). Two hundred copies were published, two of which are in the Congressional Library at Washington, numbered 22-23, Second Edition. It is as follows:

Since you Dear Doctor, saved my life
To bless by Turns and plague my wife,
In Conscience I'm obliged to do
Whatever is injoined by you:
According then to your Command;
That I should search the Western Land
For curious things of every kind,
And send you all that I could find:
I've ravaged Air, Earth, Seas and Caverns,
Men, Women, Children, Towns and Taverns;
And greater Rarities can show
Than Gresham's Children ever knew;
Which Carrier Dick shall bring you down
Next time his Waggon comes to town.
I've got three drops of that same shower
Which Jove in Danae's Lap did pour.
From Carthage brought: The Sword I'll send
Which brought Queen Dido to her end.
The Stone whereby Goliah dy'd
Which cures the Head-Ache well applied.
The Snake Skin which you may believe
The Devil cast who Tempted Eve.
A Fig-leaf Apron, 'tis the same
Which Adam wore to hide his Shame;
But now wants Darning. I've beside
The Blow by which poor Abell D'yd.
A Wet Stone were exceeding small,
Time us'd to whet his Scythe withall.
The Pidgeon Stuft, which Noah sent
To Tell him where the Waters went.
A Ring I've got of Sampson's Hair
The same which Dalilah did wear.
St. Dunstan's Tongs, which Story shows
Did pinch the Devil by the Nose.
The very Shaft as all may see
Which Cupid shot at Anthony.
And what above the rest I prize,
A Glance of Cleopatra's Eyes.
Some Strains of Eloquence, which hung
In Roman Times on Tully's Tongue,
Which long conceal'd and lost had lain
Till Cowper found them out again.
A Goad if rightly us'd, will prove
A certain Remedy for Love.
As Moore cures Worms in Stomach bred,
I've Pills cures Maggots in the Head,
With the Receipt too, how to make 'em.
To you I'll leave the Time to take 'em.
I've got a Ray of Phaebus Shine
Found in the bottom of a Mine.
A Lawyer's Conscience, large and fair,
Fit for a Judge himself to wear.
In a Thumb Vial you shall see
Close Cork'd some Drops of Honesty;
Which after searching Kingdoms round,
At last were in a Cottage found.

An Antidote, if such there be,
Against the Charm of Flattery.
I hav't collected any Care,
Of that there's plenty every where.
But after wondrous Labor spent,
I've got one Grain of rich Content.
It is my Wish, it is my Glory,
To furnish your Nicknackatory.
I only beg when'er you show 'em
You'l tell your friends to whom you owe 'em
Which may your other Patients Teach
To do as has done
Yours
T. H.

In 1745 he issued his only medical publication, entitled: "An Account of a most efficacious Medicine for Soreness, Weakness, and Several other Distempers of the Eyes." A few extracts may be of interest. After writing of the difficulties he experienced in securing the receipt, he says:

Take of prepared Tutty, one ounce; of Lapis Hæmatitis prepared, two scruples, of the best Aloes prepared, twelve grains, of prepared Pearl, four Grains. Put them into a Porphyry, or Marble Mortar, and rub them with a Pestle of the same stone, very carefully, with a sufficient Quantity of Viper's Grease, or Fat, to make a Liniment, to be used daily, Morning and Evening or both, according to the Conveniency of the Patient; as hereafter directed. . . . The Method which has succeeded with me in facilitating the efficacious Use, of the Liniment, is to bleed and blister in the Neck and behind the Ears, in order to draw off the Humors from the Eyes: and afterwards, according to the Degree of the Inflammation, or Acrimony of the Juices, to make a Drain by issues between the Shoulders, or a perpetual Blister. And for washing the Eyes, I generally recommend Spring Water, which I think preferable to any Spirituous Lotion, whether simple or compound. And the best inward Medicine I have experienced to be Conserve of Rosemary Flowers; Antiepileptic Powders, such as Pulvis ad Guttetam; Betony, Sage, Rosemary, Eyebright, wild Valerian Root, Castor etc. washed down with Tea made of some of the same Ingredients: as also Drops of Sprit, Lavendulae composit, and Sal volat oleos. If the Inflammation return, drawing about six Ounces of Blood from the Temple by Leeches or Cupping on the Shoulders, is very proper. The Liniment is to be applied with a small Hair Pencil the eye winking or a little opened. . . .

He says Dr. William Stokeham told him "He had learnt the great Virtue of Viper's Grease or Fat, in the cure of Diseases of the Eyes . . ."

And this, indeed, I judged so very reasonable, that I substituted that Grease, or Fat, in the Place of Hog's Lard which was in the original Receipt; and found, that it added so much to the efficacy of the Medicine, as to make it do, what I thought, wonders. . . . I communicated it to the late Dr. Arbuthnot: who after repeated Trials of that fat alone on sore eyes, has so high an Opinion of its Virtues, that he looked on it as equally beneficial with the whole Medicine. It is an Observation made by many Naturalists, that those Serpents cast their Skins every year, and with them the coverings of their Eyes; but how far, or whether at all, their fat is concerned in this Phenomenon I leave others to determine. . . .

In writing of the ill effects of Olive Oil upon the eyes he says: "This in my Opinion proceeds from some hot, sharp Particles, contained in the Oil . . . for I remember when at Montpelier, I was informed by Monsieur Magnol, and other of my Acquaintances there, that the feeding of tame rabbits with Olive Leaves, in want of other food has caused their making bloody Urine." He says again: "I cannot charge myself with making the least mystery of my practice. For in Consultations in a number of Cases of Importance I have been always very free, and open; far from following the Example of some Physicians of good morals and great Reputation, who have on many occasions thought proper to conceal Part of their own acquired Knowledge, alleging the Maxim—Ars est celare artem." There were, so far as I can find, four editions of this book published. In 1746 it was translated into the French.

Sir Hans gave a strong impulse to the practice of inoculation by performing the operation upon several of the royal family. The following extract is from "An Account of Inoculation by Sir Hans Sloane, Bart.," published in the Philosophical Transactions, Vol. 49, p. 518:

Upon these trials, and several others in private families, the late queen, the princess of Wales (who with the King always took most extraordinary, exemplary, prudent and Wise care of the health and education of their children) sent for me to ask my opinion of the inoculation of the princesses. I told her royal highness, that by what appeared in the several essays, it seemed to be a method to secure people from the great danger attending that distemper in the natural way. That the preparations by diet and necessary precautions taken, made that practice very desirable; but that not being certain of the consequences, which might happen, I would not advise the making trials upon patients of such importance to the public. The princess then asked me, if I would dissuade her from it; to which I made answer, that I would not, in a matter so likely to be of advantage. Her reply was, that she was then resolved it should be done, and ordered me to go to the late King George the first, who had commanded me to wait on him upon that occasion. I told his majesty my opinion, that it was impossible to be certain but that raising such a commotion in the blood, there might happen dangerous accidents not foreseen: To which he replied that such might and had happened to persons, who had lost their lives by bleeding in a pleurisy and taking physic in any distemper, let never so much care be taken. I told his majesty I thought this to be the same case, and the matter was concluded upon and succeeded as usual without any danger during the operation or the least ill symptom or disorder since. . . . What I have observed, which I think material, is not to inoculate such as have any breaking out on their faces, soon after the Measles or any other occasion, whereby small-pox were likely to be invited, and come to the face in greater number and so make the distemper more dangerous. Bleeding in plethora or gentle clearing of the stomach and intestines, are necessary; and abstinence, from anything heating about a week before; and nothing else needful by way of preparation; and very little physic during the course of it, unless accidents happen.

The operation is performed by making a very slight shallow incision in the skin of the arm about an inch long; but great care should be had in making the incision not to go thro' the skin; for in that case I have seen it attended with very troublesome consequences afterwards. After the incisions are made, a dossil dipped in the ripe matter of a favorable kind of small-pox produced naturally or by inoculation, is put into the wound covered by diapalma plaster for twenty-four hours and then removed. . . . Upon the whole it is wonderful, that this operation, which seems so plainly for the public good, should, through dread of other distempers being inculcated with it, and other unreasonable prejudices, be stopped from procuring it.

In 1695 he married Elizabeth, daughter of John Langley, a London alderman, and widow of Fulk Rose of Jamaica. She bore him one son, Hans, and three daughters. In 1716 he was

created a baronet, being the first medical practitioner to receive an hereditary title. In 1722 he was made physician-general to the army.

In 1741 feeling the infirmities of his advanced age, he retired from service, left London and took up his residence at the old Manor House at Chelsea, which he had purchased in 1714. The house was a fine one, in what at that time was a charming suburb of London. It abounded in historical associations, the chief of which were those connected with Sir Thomas More.

In 1753, on the 11th of January, he died at Chelsea, at the age of 93. George Edwards, the naturalist, says: "He was so infirm as to be wholly confined to his house, except sometimes, though rarely, taking a little air in a wheeled chair. . . . The last time I saw him, I was greatly surprised and concerned to find so good a man in the agonies of death. He died on the eleventh, at four in the morning, being aged ninety-three. I continued with him later than any of his relatives but was obliged to retire, his agonies being beyond what I could bear; though under his pain and weakness of body, he seemed to retain a great firmness of mind and resignation to the will of God." He was buried in the church yard at Chelsea beside his wife, who died in 1724. Over his grave his daughters have erected a monument.

In 1748 a statue was erected to him in the Apothecaries' Garden at Chelsea. In the National Gallery in London there is a portrait of him; one belongs to the Royal Society and one hangs in the dining room of the College of Physicians. His memory is perpetuated by such names as Sloane Street, Sloane Square, Hans Place and Hans Road.

He had a large practice among the upper classes. Queen Anne consulted him; in one of his notes he tells how it took him four hours to drive to Windsor in his coach and four; in her last illness he advised that she be "blooded." Mr. Pepys, in writing to Captain Hatton, says "you give me hopes of your recovery from the care and knowledge of our friends Dr. Sloane and Mr. Barnard . . . " (Diary, IV, 298). Pope alludes to him in his Moral Epistles (IV, 10) when he says: "And books for Mead and butterflies for Sloane"! and in his Satires (VIII, 30) he says: "Or Sloane or Woodward's wondrous shelves contain." Young, in his Satires (IV, 113) says: "Sloane, The foremost toyman of his time."

Sir Hans was tall and well made, with easy, polite and engaging manners, sprightly in conversation and very obliging; he thus made friends and became well known, commanding the admiration and respect of all with whom he came into contact.

He was a very benevolent man, broad-minded and taking a deep interest in all the activities of his time. He gave his advice freely to those unable to pay; the rich and the poor he treated alike in giving them the best he had. He gave liberally, though carefully, to those in financial distress. He was one of the founders of the Foundling Hospital. In 1721 he founded for the Society of Apothecaries the Botanical Gardens at Chelsea. He gave the Royal Society 100 guineas and a bust of Charles II. In 1732 he became one of the promoters of the Colony of Georgia. He was a governor in most of the London hospitals, and they all felt his influence. He loved wealth but did not make it subservient to his love for science. Indeed, he used much of his wealth in enriching the sciences he so dearly loved. Unless one can fully understand the social conditions under which Sir Hans lived and worked, it is not possible to estimate him at his true worth; for example, all that he did in his study of nature seems rather commonplace in the brighter light of to-day, but it was great in his time, when one possessed with a taste for collecting insects and the like was by the ablest men regarded as having a tendency to lunacy. He was a very painstaking man, or, as one writer puts it, he had an unwearyable power of taking pains.

He seems to have been so busily occupied in doing his daily tasks that he had little time for recording the events of his life, and we cannot but regret that he has left behind such meagre accounts of himself and his activities. What interesting and instructive reading would a diary of his, similar to that of Gideon Wells, be; how much light it would throw upon the medical men of those days, and in a way that can only be obtained through the records of one who, like Dr. Sloane, was in close touch with the men and their activities.

Edwards speaks of him as follows:

The charities of human life were not, in the breast of Sir Hans Sloane, choked either by the various allurements and preoccupations of science or by the ceaseless toils of a busy and anxious profession. The multiplicity of claims was, indeed, as notable as was the patience with which they were listened to. Not to dwell upon the innumerable gropings after money, of which, in one form or another, every man who attains any sort of eminence is sure to have his share (but of which Sir Hans Sloane seems to have had a Benjamin's portion), or upon interminable requests for the use of influence—at court, at the Treasury, at the London hospitals, at the Council Boards of the Royal Society or of the College of Physicians, and elsewhere—his fame brought upon him a mass of appeals and solicitations from utter strangers, busied with the less worldly aims and pursuits. Enthusiastic students of the deep things of theology sought his opinion on abstruse and mystical doctrines. Advocates of perpetual peace and of the transformation, at a breath, of the Europe of the Eighteenth century into a Garden of Eden, implored him to endorse their theories, or to interpret their dreams. . . . To one of the enthusiasts in mystic divinity, who had sent for his perusal an enormous manuscript, he replied, "I am very much obliged for the esteem you have of my knowledge, which I am very sure comes far short of your opinion. As to the particular controversies on foot in relation to Natural and Revealed Religion and to Predestination, I am noways further concerned than to act as my own conscience directs me in those matters; and am no judge for other people. . . . I have not time to peruse the book you sent." (Edwards' Lives of the Founders of the British Museum, Vol. I, p. 292.)

The same author says:

To the worthy and once famous Abbé Saint Pierre, who would fain have established with Sloane a steady correspondence on the universal amelioration of mankind, by means of a vast series of measures, juridical, political and politico-economical, which started from the total abolition of vice and of war, and descended to the improvement of road-making, by some happy anticipation, a hundred years in advance of our own macadam, he wrote thus: "I should be very glad to see a general Peace established forever. Rumors of war are often, indeed, found to be baseless, and the fears of it, even when well grounded, are often dissipated by an

unlooked for Providence. But poor mortals are often so weak as to suffer, in their health, from the fear of danger, where there is none." (*Ibid.*, p. 293.)

The British Museum owes its origin in great part, and some say altogether, to Sir Hans Sloane, and no review of his life is complete without a reference to that institution. In 1702 Dr. Sloane secured the collection of William Courten, in 1710 that of Plukenet, and in 1718 he bought the collection of John Petiver for £4000, so that in 1753 his library contained 3516 manuscripts, 347 drawing and 40,000 books. The Sloane manuscripts contain letters and notes by most of the chief physicians of the century preceding Sloane's death and must always be one of the main sources of medical history in England from the time of Charles II to that of George II.

He bequeathed his books, manuscripts, prints, drawings, pictures, medals, coins, seals, cameos, and other curiosities to the nation on condition that Parliament should pay his executors £20,000.

When the subject was presented to George II, he received it with indifference and dismissed the matter with the remark that he did not think there was £20,000 in the Treasury. No money being available from the government, it was decided to raise the sum needed by a lottery: 100,000 shares at £3 each were authorized. Of the money thus secured £200,000 was allotted for prizes and £100,000, less expenses, were to be used in the purchase of the Sloane and Harleian collections and to provide a place for their safe keeping. A great scandal resulted from the traffic in tickets by one Leheup. "By this unfortunate episode, the name of one of the best of Englishmen was brought into a momentary connection with the name of one of the worst," so says a writer.

The bequest having been accepted and the money raised, the Sloane collection, together with that of George II's Royal Library, was opened to the public at Bloomsbury as the British Museum in 1759, six years after the death of Sir Hans.

As a fitting close, let me leave with you his counsel. "I advise you," he would say, "to what I practice myself. I never take physic when I am well. When I am ill, I take a little, and only such as has been very well tried."

The chief authorities consulted were Edwards' "Lives of the Founders of the British Museum" and Jardine's "Naturalist's Library."

NOTES ON NEW BOOKS.

Psychanalysis. By A. A. Brill, Ph. B., M. D. (*W. B. Saunders Co., 1913.*)

The main object of this book is to present the practical application of Freud's theories in one volume in the hope of stimulating further interest in Freud's original works. The book consists of 325 pages divided into 12 chapters, dealing with, among other things, the Psychoneuroses, Dreams, Psychopathology of Everyday Life, Oedipus Complex, and Anal Eroticism and Character. The substance of the majority of these chapters has already been published in various medical journals, and consequently considerable repetition occurs throughout. The last chapter on Freud's theory of wit is prolix, and not by any means convincing.

Although some of the explanations and dream interpretations may be considered rather fanciful, still the author should be congratulated on having done his work so well, and for having presented such a difficult subject in a clear and concise way.

General Paresis. By Professor Emil Kraepelin. Translated by J. W. Moore, M. D. Journal of Nervous and Mental Disease, Monograph Series, No. 14. (*New York: 1913.*)

This is a translation of Kraepelin's article on general paralysis contained in the 8th edition of his text-book on psychiatry. The clinical descriptions are exceedingly detailed, and do not serve any specially useful purpose. There is nothing new or particularly enlightening about the article, and it is difficult to realize why its translation was undertaken.

The Surgical Clinics of John B. Murphy, M. D. Volume II. Number 2 (April, 1913). Illustrated. Published bi-monthly. Price per year, $8.00. (*Philadelphia and London: W. B. Saunders Company, 1913.*)

This number of the *Clinics* furnishes the usual quota of remarks on a broad variety of surgical topics. We believe the *Clinics* would be more valuable were they grouped, so that one number might be devoted entirely, for instance, to amputations, another to operations on the gastro-intestinal tract, etc. They seem to us more interesting as an exhibition of Dr. Murphy's wide versatility, than broadly educative to the reader unless he is already well trained in surgery.

New and Non-official Remedies. (*Chicago: American Medical Association, 1913.*)

This publication, first started in 1907, has grown yearly more and more important, and to-day there is no excuse for a general practitioner to prescribe any non-official remedy not included in this list. The committee of the association having the work in charge of examining these remedies is liberally inclined, and describes all on the market that are really valuable. The cheapness of this volume—only twenty-five cents in paper—brings it within the reach of all; and every member of the association should secure a copy and keep it close beside him.

A Manual of Surgical Treatment. By Sir W. Watson Cheyne, Bart., F. R. C. S., etc., and F. F. Burghard, M. S. (Lond.), F. R. C. S. New (2d) Edition. Thoroughly Revised and Largely Rewritten. $6.00, net, per volume. (*Philadelphia and New York: Lea & Febiger, Publishers, 1913.*)

The fourth volume of this excellent work is arranged in four divisions: 1, The surgical affections of the jaws and tongue; 2, of the pharynx and oesophagus; 3, of the stomach and intestines; and, 4, of the rectum and anus. This is certainly the best English surgical manual, and one of the best in any language. When completed it will be a noteworthy addition to the extensive list of surgical treatises. All thorough students of surgery will be glad to have this work on their shelves. It is practical and authoritative; it is comprehensive but concise, and is a useful book for students.

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